

ADDs opens and closes in days

by John Riley
ONLY days after launching a new terminal in the UK, US terminal manufacturer Applied Digital Data Systems (ADDs) has closed down its UK-based Displays Division European sales office.

ADDs believes that it can give its European terminals distributors better support and service from New York than from London. The company is still keeping its office, which handles business systems using the Pick operating system.

"We are not slamming the door on Europe," emphasised John Witherow, ADDs vice-president and general manager of Displays Division. "We have transferred our European sales office functions to our corporate office, and these distributors can now talk directly to the factory, engineers and customer marketing, without going through an intermediary in the UK."

"It is not much different for a German distributor to phone the US from Munich as to phone the UK," he says, adding that European distributors are happy with the new arrangement.

According to Don Wood, managing director of Data Dynamics: "Twelve months ago ADDs had six distributors in the UK covering the range. Now there's only us, as we've outsold everybody. ADDs has ended up with one good distributor in each country and ADDs decided that we should run the show."

"We don't want ADDs as a middle man in Europe. We're totally self-supporting and ADDs' move will also help us improve our own responsiveness," Witherow adds.

Data Dynamics recently bought the manufacturing rights to Shelton Instruments' microcomputers. Riva Terminals is another ADDs distributor, but it specialises in graphics terminals.

Witherow denies that the new arrangement would make it difficult for ADDs to expand its distributor base.

"I don't see any change in our international distributor programme," he says.

"New prospects can find out what sort of organisation we are by making telephone calls."

"Our current distributors are very strong on the support element, and customers look upon the distributors as vendors."

He explains that the Systems Division products, which are sold through dealers, are a different kettle of fish and need a sales office.

"Systems Division needs to give a great deal of after sales support for the dealers, but in the Displays Division terminals are cheaper, have fewer components and less demanding when it comes to after support."



WITHEROW... "We are not slamming the door on Europe."

SALES BRIEF

Racal brings Siemens sum to £6 million

RACAL has now exported computer-aided engineering equipment worth £6 million to the West German electronics giant Siemens after announcing a single order of one million pounds for its Cade and Maxi systems.

The systems are used in printed circuit board design, and after latest delivery, Siemens' text and data communications development team in Munich will use the Cade Cadet for data capture from schematic drawings. Racal-Redac has now sold 100 CAE terminals to Siemens, 300 to West Germany, and 600 worldwide.

Aussie deal

SARASOTA Automation, which makes computer-based equipment for measuring gas flow, has won a £500,000 order from Australia. Thirteen metering systems, with associated software, are to be installed on the 1,100 mile Dampier to Perth pipeline in Western Australia.

Fluid partners

PERKIN-ELMER has supplied two 3250 supermini computers to its own Partnership Plan dealer Cham for consultancy work in fluid dynamics, combustion and heat flow. Cham is developing computer models for these applications.

RAF upgrades

THE Royal Air Force has ordered two pairs of ICL 2957 mainframes to upgrade the computer system serving its equipment supply depots. The main application is control of the collection and dispatch of over a million different stock items to supply RAF bases throughout the UK.

Midas wins again

BIS SOFTWARE has scored another export order for its Midas banking system in a £190,000 contract with United Gulf Bank in Bahrain. The system runs on IBM minicomputers and contains 1,100 programs, some tailored to each bank's needs. Midas has now been installed at 230 banks in 52 countries, and has twice won BIS the Queen's Award for Export Achievement.

More gas orders

FERRANTI Computer Systems has now sold 500 terminals to North West Gas after taking a further order for 200 to be supplied over the next two years. The latest order is the third from NW Gas, and includes 30 PT7-154 controllers as well as the terminals for connection to an ICL 2900 mainframe.

Hall copies sister

ADAM Hall Supplies, wholesaler of amplifiers and special effects equipment for live music, has gone to Nixdorf for a mainframe to handle stock control, order processing, and word processing. A similar Nixdorf 8870 computer is used by Adam Hall's sister company in West Germany.

Centre-File's £1m

BUILDING societies have spent over £1 million on bureau and turnkey services with the National Westminster Bank's computer services subsidiary, Centre-File, in the last two months. The company has supplied Eastbourne Mutual Building Society with a system based on Philips Counter Terminal equipment linked to its bureau. The subsidiary's other orders include contracts from Hinckley & Rugby and Sussex Mutual building societies, which are moving from the bureau service to a turnkey system based on Texas Instruments' Business System 800 computers.

ICL tipped to win PO millions

by Philip Hunter
ICL is not favourite to cash in on most of the £100 million worth of business from the Post Office's counter automation programme announced last week.

ICL and three other companies, Philips, NCR and Burroughs, have taken part in trials at four post office branches, each supplying counter terminals designed to handle all post office transactions.

All four will be considered when the contract goes out to tender in the spring and other suppliers will not be excluded. Post Office director of Information Technology, Charles Read, hints that ICL, as the only UK-owned company among the four participating in the trial, is a strong favourite.

"There is plenty of choice among UK-made equipment, and it would probably be frowned upon if we didn't buy British," he says.

However ICL is unlikely to pick up all the business, because for one thing it cannot yet supply automatic teller machines (ATMs). Part of the automation plan is to install 180 ATMs in post offices by 1986.

Both NCR and Philips can supply ATMs and NCR is the market leader.

The contract for the software will probably be awarded separately, says Read, because the major contractor would be quite likely to sub-contract it anyway.

Logica is favourite to win the software contract, since the company has already been given the job of designing the network. The Post Office has also hired Pactal as consultants to help control project management.

The outline is to introduce automatic teller machines (ATMs) for dispensing cash, and eventually to



READ... "It would probably be frowned upon if we didn't buy British."

give all counter clerks terminals linked to computers to register transactions and verify cash withdrawals.

A first stage investment of £20 million is planned to install equip-

ment in 1,200 post offices, starting at the end of this year. About 50 post offices will come online each week, extending counter automation to the 2,000 main and 7,000 sub-post offices by 1990.

Another crucial aspect of the programme is to link the post office computer network to the Department of Health and Security, Driver and Vehicle Licensing Centre and the National Girobank.

Visicorp slashes the VisiOn price by 81%

by George Black
VISICORP has knocked 81% off the price of its VisiOn windowing environment. The move indicates a coming price war in the world of micro operating systems with attractive add-ons.

In particular, Visicorp seems to be reacting in advance to

Microsoft's launch of its Windows product at the end of April.

The comparison of the two systems is not a direct one, as Visicorp is selling to the end-user and Microsoft will deal only with hardware manufacturers. It looks, however, as if Visicorp is worried that the manufacturers may be

offering Windows to their customers as an enhancement of the MS-DOS system at a mere £100 extra.

Visicorp slashed VisiOn in the US from \$495 to \$95. Although its UK distributor Rapid Terminals has not yet announced a parallel cut, a fall to around £70 is predicted.

European marketing director for Visicorp in Paris, Jean-Claude Caras, says: "We are selling well, but we want to ensure our position in the market by this new lower price."

When VisiOn was announced last August, the package price, including a mouse cursor-controller,

graphics, word processor and spreadsheet was \$1,295. Visicorp says it has no plans to cut the cost of the applications which together still add up to \$1,365, despite the latest slash. Around half of Visicorp's outstanding orders are said to be for the unbundled applications.

Ada skills bring in the dollars

by Philip Hunter

US ADA programmers are reveling in a boom in the language, now that fully validated compilers are available. Programmers can bump up their salaries by 20% if they learn about Ada, giving an extra \$4,500 for a junior, and \$8,000 for a team leader, according to the US AdaData newsletter, published by International Resource Development.

Demand for Ada programmers in the US is rising at all levels, following the US Department of Defence stipulation that key defence projects must be based on the language.

UK Ada programmers have at present rather less reason for euphoria, following the cancellation of the £9 million UK Ada MCHAPSE project, and lack of certainty about government policy on real time defence languages.

There is hope, however, that part of the UK project will soon be resurrected, and both the Ministry of Defence and Nato are still committed to the language, according to Commander Trevor Syms of MoD's central staff.

Meanwhile UK Ada programmers are already in demand, and being paid more than the average programmer, according to Richard Emerson, marketing manager of High Integrity Systems, which employs five Ada programmers working on board level implementations of Intel's Ada compiler.

"People already employing Ada programmers have to be entrepreneurial companies working on advanced projects," he says. In the UK, the shortage is not so much of Ada programmers, but of well-trained programmers in general, Emerson says.

Air Call calls up the French

by Donald Kennett
AIR Call is talking to the French company Matra about importing its Minitel electronic telephone directory terminals.

Both companies say that talks are at an early stage, but Air Call has bought about 100 Miniteles for its own use and is preparing to put them through the technical approval process required for attaching equipment to the public telephone network.

Air Call's own use for the terminals is in conjunction with its newly launched Pocket Telex ser-

vice (see page 8). The company would also like to sell the terminals to customers using the service to send messages directly to staff carrying the Pocket Telex units.

Since developing the central system for the Pocket Telex service, Air Call has made two overseas system sales, in Sweden and Canada.

Air Call's own operators use Tandberg terminals to enter messages on behalf of clients, but the company also wants a low-cost alternative terminal for people who make less frequent use of their mo-

bile messaging facilities.

Paging systems project manager Peter Burridge says that Air Call would expect to sell the Miniteles for about £400 each. They have a 10-inch monochrome screen and a small alphanumeric keyboard and Burridge says that their advantages over similar UK-designed products include a store of 36 telephone numbers for autodialling.

Matra is one of four French companies to be commissioned to make terminals for the French PTT's electronic telephone directory programme.

Acorn gets factory cash

by Philip Hunter

BBC ACORN specialist Midwich Computers has raised £250,000 to build a factory to assemble disc drives and possibly microcomputers at its base town, Diss in Suffolk.

The money for the project came from a group of its institutional shareholders, including ICFP (Industrial and Commercial Finance Corporation).

Managing director David Watson says that the investment was clinched by the company's good half yearly results, a profit of £131,000 on turnover of £1.2 million.

As well as expanding in the market for assembled products through the new factory, Watson wants to build on the company's present education market. Midwich is one of seven approved suppliers of upgrade kits for the BBC Acorn microcomputer, and has supplied an Italian Z80-based microcomputer to local authorities for use in education.

According to Moore the initiative came from GEC McMichael.

GEC makes home move at last

by Nuala Moran
GEC HAS finally moved into the home computer market. Its consumer electronics division, GEC McMichael, announced last week that it will take over the sales and marketing of Dragon Data's products.

No numbers have been put on the deal. "We will agree sales forecasts and targets but the market is too volatile for fixed agree-

ments," says Moore. Dragon will retain its present sales force of four. At the moment it makes most of its sales through Dixons and Boots, backed up by about 200 dealers.

Moore says that the two companies will also collaborate on producing new products.

According to Moore the initiative came from GEC McMichael.

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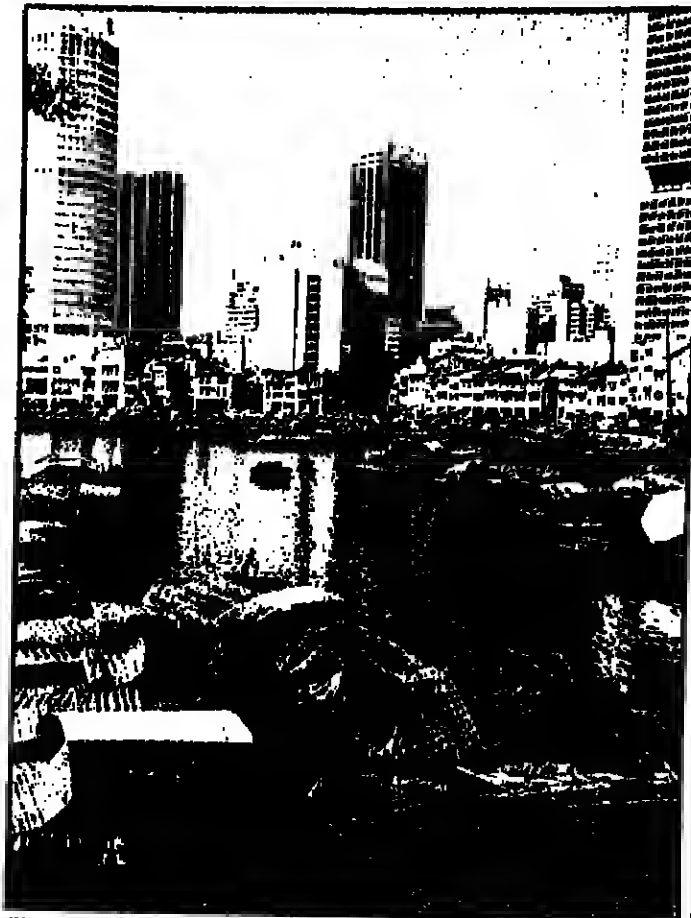
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Singapore... membership of the IDPM is improving.

IDPM spreads word in Asia

by John Kavanagh
UK COMPUTING qualifications will be promoted across south-east Asia — one of the world's fastest-growing computing markets — next month when Ted Cluff, secretary-general of the Institute of Data Processing Management (IDPM) visits the area.

"I'd like to encourage formal recognition of IDPM qualifications by the Malaysian government," Cluff says. "Malaysia is where the IDPM's real strength lies in the Far East. We have over 800 students and 50 professional members there. Around 310 took our examinations in December."

Cluff's visit to Malaysia, Hong Kong and Singapore comes just as the UK's National Computing Centre is pushing for more business in the region. NCC director David Fairbairn was in the area last summer, and he pointed out

that the countries had both a need and historical ties with the UK.

In Hong Kong, Cluff will encourage a new IDPM branch with 42 full members and 50 students. He says there is a "modest presence" in Singapore, but in the last month, membership there has improved, with nearly 90 students from one school joining and over 150 from another college showing interest in the exams.

"Almost half the IDPM's 2,500 student members are in the Far East and around 8% of the 5,000 full members."

Other strong overseas branches are in Sri Lanka, Nigeria, Greece and Malta. "No one knows how these things start," Cluff says. "It just seems to spread by word of mouth or the hush telegraph. IDPM people pop up all over the place."

Lifeboat resurfaces after four months

SOFTWARE distributor Lifeboat Associates has emerged in the location of Marlborough, Wiltshire, four months after closing its doors in London.

Lifeboat's new distribution agreement with Roundhill Computer Systems of Marlborough is the first sign of life since Lifeboat ceased trading in October with the promise of re-organisation and a new look.

Roundhill has been picked to distribute the Lifeboat products, based on the Unix language C, because of its involvement with both C and Lifeboat. Roundhill director Tim Prew has close links with

Lifeboat, and is the author of the Panel screen design tool, which is part of the suite of C development tools known as C Chest.

The C Chest includes the Lattice C compiler, the Plink-86 overlay linker, the Panel screen design aid, the PMATE programmer's editor, and the Halo graphics package.

The Lattice compiler is available in a new release supporting MS-DOS and PC-DOS. Roundhill's Panel screen designer also has a new release supporting Lattice C. The product already works with Cobot and Pascal, and the IBM language PL/I.

Ex-Storage men buy abandoned project

by Keith Holder
US PLUG compatible manufacturer Storage Technology has sold the virtual storage system project it had abandoned to four former employees, who are starting up a company to carry on work on the system.

Storage Technology will have a minority financial interest in the new firm, Data & Expert Systems International (DESI), together with Borg Warner.

Although neither investor has any automatic rights to manufacture or market DESI products,

Brian Molloy, Storage's UK managing director, says: "If it can produce a useful product, we would be interested in talking about a deal for distributorship."

The move comes after Storage Technology abandoned its mainframe development programme, and is seen as part of a wider plan by the company to streamline, supporting only its plug compatible disc storage and optical disc devices.

The latter is known to have soaked up a lot of the company's financial resources, and is only just

beginning to be shipped in reference sites in the US. The company's 80 series of IBM 3380 compatible disc systems has also been slow to get off the ground, though Molloy says he is confident that it has a healthy future.

This has fuelled speculation that Storage is pruning its activities and trying to cut costs while its mainstream products need support.

By reducing itself to the role of minor investor in DESI, Storage is able to keep tabs on any developments without having to report publicly results of its

financial interest.

Barry White, head of DESI, former head of virtual systems development for Storage Technology, says that future will closely follow the concept, but not necessarily the software or hardware previously developed.

He indicates that DESI will build its own control disc and storage units, unlike Storage plans to use Magnetics IBM compatible hardware, though it would still offer IBM mainframe compatibility.

Passmore quits DEC

by John Kavanagh
DIGITAL Equipment's UK marketing manager, Bill Passmore, left the company last Friday following former UK managing director Darryl Barhé to Sun Microsystems.

Barhé left two months ago, soon after microcomputer business manager Lawrence Cattell, Paul Musson, who replaced Cattell, has moved up again to take Passmore's job as number two man in the UK. He will work with new managing director Geoff Shingles.

Passmore's departure comes after a year in which DEC lost not only Barhé but also eight top executives in the US. DEC has just promoted nine long-serving staff to vice-presidents to fill the gaps.

Passmore has been marketing manager since 1979. He becomes managing director of Sun's UK company. Barhé is head of European operations. Sun, a US firm, builds a graphics workstation based on the Motorola 68000 processor and offering the Unix operating system and Ethernet local networking.

Musson joined DEC in 1977 and has had management jobs in sales and sales training. He will keep his responsibility for personal computers.

The nine US promotions involve sales, manufacturing, peripherals, software and education.

Customers are showing little concern over the UK moves. "I see DEC as an entity," says Cliff



PASSMORE... Joins Sun.

Evans, deputy chairman of the users' association. "Personalities make a bit of difference, but people move around a lot in this business. From my talks with users, this does not seem to be a big concern."

Motorola sets BT lines free

by Donald Kennett
BRITISH Telecom's top 100 customers will be able to make efficient use of their Megastream and Kilo-stream leased digital telecommunications circuits for the first time from this summer, according to Motorola Information Systems, which is launching the device facilities.

The device, called the Ultramux, is a high-performance multiplexer that can handle a mixture of digital voice, data and video channels with an aggregate data rate of up to 10 Mbit-per-second.

It can also be connected to a mixture of transmission circuits — such as local area networks, private optical and microwave links, and British Telecom's recently introduced Megastream and Kilo-stream digital leased lines — and will re-synchronise transmission to the different timing requirements of each.

It is made in the US by Avanti

Communications, and Motorola has worldwide distribution rights, exclusive to some places including the UK.

According to sales manager John Bleach, it is often impossible to connect one Megastream or Kilo-stream circuit directly to another to form a multipoint network because, although the timing for each one is controlled from the same master clock, the pulses get out of phase with each other because they arrive at different routes.

The only solution, Bleach says, is to buffer the data and re-synchronise it. And the only types of equipment that do this are large and expensive up-to-date PABXs and re-synchronising multiplexers such as the Ultramux.

But rival products only handle trunk speeds of up to two Mbit-per-second (BPS) compared with the Ultramux's 10Mbps, he adds, and PABXs waste bandwidth by giving all data channels slower than 64Kbps a full 64Kbps channel each.

Norbain joins USM

THB Norbain Electronics Group of Reading is coming to the Unlisted Securities Market by way of a placing through prolific high-tech broker Simon and Coates.

Mike Whitaker, who is handling the issue, will not reveal pricing details but says that the company is forecasting pre-tax profits of around £600,000 on turnover of £3 million in the year to March 31, 1984.

Norbain's main business is the distribution of opto-electronic components, but it also has a growing microcomputer and peripheral distribution arm which handles Bspont products.

Broker A. G. Becker is to place shares in Wordnet under 163 of the Stock Exchange, which allows brokers to deal in unquoted stock — Sinclair Research and Intelligence UK shares are handled in this way.

Bull and Philips reach agreement on smart cards

by John Riley
RIVAL smart card manufacturers Bull and Philips Datasystems last week signed a bilateral agreement to standardise the technology in the cards' production.

Both the French owned Bull and the Dutch-owned Philips Datasystems produce smart cards three years ago. It will use programmable Microprocessors and try to bring their technology together by the International Standardisation Organisation as a world standard. Both companies will still own industrially and commercially.

Smart cards, which are cards containing a microprocessor and memory, are increasingly being used in the retail, banking and security industries. There is a growing demand from these industries that standard cards be used everywhere.

"Our major banks, for example, prefer two sources rather than one and the establishment of international standards called for by us is an essential condition for further development of this technology," says a Bull spokesman.

The agreement gives both companies transfer rights, so that they can exchange the electronic data masks already in use as well as those they develop in the future.

By taking the lead, both companies hope to pre-empt IBM and other companies developing smart card technology.

Only last month, three Canadian companies got together with the aid of a \$225,000 government grant to produce smart cards. See also page 19.

Hoskyns is anxious to go buying

SYSTEMS house Hoskyns is to hit the acquisition trail, and is looking for both products and companies to buy.

Managing director Tony Robinson explains: "We set up the project at the beginning of the year to look at systems or companies that we should purchase. We have always shown a consistent and stable growth of 20% to 30%, and this is one of the options."

Robinson will not specify the areas that Hoskyns is looking at, but makes it clear that the company will not be restricting itself to the UK. He says: "We have always chosen to expand our activities by moving into something close to our existing products."

The Hoskyns director responsible

for the project is Tony Fisher, who currently handles the company's fourth generation or "programmer productivity" products. The bulk of these are currently software systems developed by US software house Mathematica, which was acquired last year by Hoskyns' parent company, Martin Marietta. Mathematica is best known for its database management system, Ramis II.

Barry Hodson, head of Hoskyns' industrial systems division, is due to go to the US to look at systems developed by Marietta Information Systems.

Martin Marietta is a US conglomerate with interests in construction materials, chemicals, aluminium and aerospace. The lat-

ter is expected to bring in \$3 billion in revenue this year, and the company is actively shedding some of its non-aerospace subsidiaries.

Robinson says: "Martin Marietta has always given us our independence. Dealing with the company has been like dealing with an ordinary group of shareholders."

About one third of Hoskyns' current revenue comes from its facilities management side, and the company claims to have the biggest turnkey systems operation in the UK. It specialises in DEC

systems and also ships a smaller amount of ICL-based systems.

Robinson estimates that the company's personal computer side is selling at a rate of \$3 million a year now. It sells IBM, DEC, Hewlett-Packard and Apple's Lisa.

NCC bids to make names for itself

by Claire Gooding
THE National Computing Centre (NCC) is attempting to convince the Registrar of Trademarks that its Filetab and Userlab products are worthy of registration. The NCC wishes to protect itself against any future disputes over the names, but first has to prove to the Registrar that neither name is a generic term, or recognised as anything other than the name of a particular product.

NCC has just come to the end of a protracted lawsuit against Filetab Support Services concerning Userlab and FSS, and wants to guard against any future disputes.

"It's a question of protecting our property rights to the name," explains NCC contracts manager John Morris. "At present, if someone else were to use the name, we could sue for passing-off, but it would be up to us to prove that our name and reputation were being damaged. If the names are already

registered, it gives us a head start, as the burden of proof then shifts to the other party."

One of the most common problems is proving that the name is not a commonly used term with a general meaning, rather than a specific product. "Since we've strung together two terms common in computing, File, and Tab, the Registrar may want further proof of our reputation, to prove that people recognise the product by that name."

The fact that the name Filetab is used as part of Filetab Support Services is no hindrance, nor should it cause any problems for either party, says Morris.

"It goes some way to helping our case, as it proves that the product is widely known under that name," he adds.

The NCC has been distributing questionnaires to people in the computer industry as part of preparation for its case.

NCR chip set finds buyer

by Keith Holder
HONEYWELL has become the first outside customer for NCR's microprogrammable 32-bit chip set. The agreement, signed last week, also calls for the companies to work together on a customised interface chip which will form part of a new Honeywell system.

The system is likely to be a 32-bit virtual machine which Honeywell committed itself to at the start of the year. It will form part of Honeywell's DFS-6 series.

James Renier, Honeywell's president of information systems, says that the decision to go for the NCR chip set is in keeping with the company's policy of reducing research and development times, and hence product development times. By the strategic purchase of technology, and entering coopera-

tive agreements.

He says that the new system will retain compatibility with selected hardware and software products.

Charles Exley, NCR's president and chief executive officer, says that this will be the first of many such agreements. He adds: "The NCR/2 can emulate a variety of system architectures, and will appeal to a wide customer base, enabling them to exploit this advanced technology."

NCR claims a price performance advantage of up to 40% for the chip set, and says that it outperforms all of its 32-bit rivals.

The main advantage to outside customers, says NCR, is the external microprogram store.

This allows instruction sets to be tailored to fit existing software.



ROBINSON... "Martin Marietta has always allowed us to be independent."

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Universities get silicon centres

by Nuala Moran
SILICON broking centres are being set up at five universities to help academic researchers gain access to chip technology.

The centres will be financed by the Science and Engineering Research Council (SERC) with the aim of providing a fast prototyping service for silicon chips.

The centres will be at Edinburgh, Newcastle, Southampton, University College London (UCL) and the University of Manchester Institute of Science and Technology (UMIST).

Three of the centres will have links with industry. UMIST will collaborate with Ferranti, Newcastle with Plessey and UCL with GEC.

In the case of the UMIST centre, this means that Ferranti's uncommitted logic array (ULA) technique will be available to researchers in a variety of disciplines who need help in designing chips for instruments or apparatus.

UMIST is getting £300,000 to set up its centre. This will be spent on the purchase of capital equipment and in recruiting four project officers.

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COMPUTER SYSTEMS

Air Call hopes for a mobile world

by Donald Kennett

THE beginnings of a universal, low-cost mobile text communication service have been launched by the radiopaging company Air Call.

The service, which Air Call calls Visual Paging or Pocket Telex, uses Motorola receivers roughly the size of a cigarette packet. The receivers have a 12-character liquid crystal display and a 160-character memory.

Messages can be accepted into the system from any kind of computer or terminal with a modem or from the telex network, and the system prompts for the correct format.

Deputy managing director Maurice Henchey says: "The telex network continues to expand at more than 30% a year and we expect to give a boost to the growth."

Henchey says the company has invested half a million pounds in the first phase, which covers the London area from Borehamwood to Croydon and Dartford to Hounslow. It aims to make major extensions throughout the UK this year. The investment includes a 10,000 line public telephone exchange bought from British Telecom, which enables each paging unit to have its own telephone number.

It has also developed software for the system, to run on Digital Equipment Vaxes, Rair Black



HENCHY... "Telex network continues to expand at more than 30% a year."

Boxes, Tandberg intelligent terminals and specialised processors for telephone answering and radiopaging services made by Startel and BBL in the US.

It has already sold systems products and software developed to the UK service to the Swedish PTT and a paging service in Canada, and it will be able to use them in its operations through

subsidies and partners in Belgium, France, Italy, Switzerland, Spain and the US.

It is able to provide software to support special applications of its services on users' personal computers and word processors through its subsidiary Air Call Computer Systems and through Altec Computers International, with which it works closely.

The launch of the Pocket Telex service has been delayed by development problems Motorola had with the receiver.

The delay has enabled Air Call to include from the start enhancements it had planned to add as the service developed, such as providing hard copy records from the service centre and storing messages in case they are lost.

MSC fund home learning kit

A "HOW to service your microprocessor kit" is to be developed with funding from the Manpower Services Commission. The kit will be part of an open learning programme to help micro servicing engineers update their skills.

It is being set up by the Micro Electronics Educational Development Centre (MEDC), in Paisley, Scotland.

Through its Open Tech Unit (OTU) the MSC will put £140,000 into the three year project to develop the programme. This will be matched by £140,000 from the Scottish Education Authority. The programme will consist of six modules, and people will be able to choose any number of these according to the skills they need.

The microprocessor kit will be used by people in their own homes to learn about fault finding. It is intended that the kit could later be used for fault finding on the job. This will ensure the learning is integrated with the person's job.

Simon Perryman of the OTU says: "A number of options are being looked at and a decision expected in March. The kit may be based on an adapted home computer, and one of the possibilities is an adapted BBC micro."

According to Perryman, the OTU has identified a shortage of skills in the microprocessor servicing area. "This, of course, is a growing problem because the number of microprocessors in the country is increasing rapidly. It is a very cost effective way of giving people the right skills."

"The idea is not to train people from scratch but to update people already in that line of work."

Perryman says there has been tremendous interest from companies wanting to set training schemes. British Leyland is spending £1 million over the next five years to set up drop learning centres with computers and videos to update the skills of the Austin Rover workforce in botanics, engineering, and diagnostics.

OTU made a grant of £30,000 towards the centres.

MICRO NEWS Exxon and Zilog settle with NEC

by Keith Holder
CALIFORNIA chip manufacturer Zilog and its parent Exxon have ended their patents dispute with Nippon Electric Company (NEC) with an out-of-court settlement.

A spokesman for Zilog confirmed that NEC would be granted a licence to manufacture legitimate copies of Zilog's Z80 microprocessor and "some other as yet unspecified products". All charges against NEC have been completely dropped.

It was NEC's manufacture of Z80 copies which prompted Zilog to take the matter to the US International Trade Commission (ITC) last June and seek \$30 million in damages for patent infringement, from the Japanese company.

The ITC started an investigation, but this has been closed as a result of the settlement.

Ironically, the existence of NEC's Z80 copies on the market did much to boost sales of the Zilog product, as it provided micro makers with second source of supply.



HAVERSON... "Wanted to be ready on day one."

Intel bids for a fresh identity

by Keith Holder

INTEL has brought its iD15 and iTPS commercial database information systems to Britain, strengthening its bid to become a recognised systems manufacturer.

The two products will be distributed by Rapid Recall, which has been selling Intel kit for 10 years, and is now its No 1 distributor in Europe.

The products have been available in the US for six months, and have produced encouraging sales, says Peter Haverson, Intel UK divisional director.

Both systems are aimed at the lucrative multi-user, distributed systems market. According to Haverson, this market should be worth about \$600 million by next year. Intel is aiming for a 10% slice.

The choice of Rapid Recall as distributors was made to help target the systems at the right potential user base, says Steve Spill,

Intel UK systems sales manager. "Apart from our past relationship with Rapid Recall, we could see that they were already familiar with dealing with the customer base we are trying to hit," he adds.

Rapid Recall also made a "substantial investment" in setting up operations to handle sales and support.

Haverson says it was this, rather than any strategic planning that led to the delay between the US and UK launches. "We wanted to make sure we were completely prepared and ready to go on day one."

The systems offer users the ability to link up workstations or microcomputers forming a "data bus" between them which may then be connected to any mainframe, via a data pipeline, says Haverson.

iD15 is a combination of hardware based on the 8088 processor and software and in-

cludes on SQL compatible relational database (iDB), spreadsheet, word processing, electronic mail and calendar facilities.

It is based on Xenix, the Microsoft version of Unix, and allows users to download and work on files, from the mainframe. iTPS is a similar multi-tasking system designed to be an applications generator for transaction-based systems incorporating a relational database.

Spill denies that the systems might bring Intel into competition with IBM's Popcorn multi-user system, when it is launched. "Our success will come from penetrating the OEM dealer market with these products. This is an area IBM has not really touched, so we won't find ourselves competing."

Haverson says Intel's internal demand for the much-wanted 8088 chip will not affect supplies to its outside customers as the volumes will be "relatively small".

Duport claims winner with micro bureau

by Philip Hunter

THE idea of setting up a microcomputer bureau service may sound strange at first because the hardware is now relatively cheap compared with the cost of running it.

But this is what Duport Computing has done in the West Midlands, and managing director David Kelsco thinks he is on to a winner.

This argument runs thus: although the hardware is cheap, first-time business users are faced with the cost of software training, or hiring a systems analyst to run their computer if they want to

make the best use of it.

Users of the bureau can try out various micros and software packages before deciding on a particular system. Then they can go to Duport's new high-street shops, the first of which has just opened in Wolverhampton, to buy it.

Just as big businesses once found the old mainframe bureau an ideal temporary solution to their problems, Kelsco argues, now the small business will find it so. "£100,000 to a big business is equivalent to £2,000 to a small business," he says.

"The user can come to our shop once a week, and run the application himself, or get one of our staff to run it."

The cost is £5 an hour for the use-it-yourself service, or nearer £10 if Duport's staff have to help out.

Duport plans to open more shops in the West Midlands to sell micros and software. In addition, on-the-job training will be offered through Duport's subsidiary, NK Training.

The first Duport retail shop in Wolverhampton stocks micros from ICL, Sanyo and ACT.



Sponsored by Computer Weekly

Eligibility for entry

THOSE eligible to take part in Computastars fall into the following categories:

1. Only personnel who are fully costed to data processing activities.
2. Only personnel who were employed by their present company prior to February 1, 1984, can represent that company.
3. Should a competitor leave the employ of the company be or the representative, that person will no longer be eligible to represent that company after the leaving date.
4. Companies may enter as many teams as they wish, subject to eligibility. A competitor may represent only one team, and having been nominated for team in the competition during the current year.
5. Teams wishing to enter the Veterans section (over 35 years old or

over on February 1, 1984. Teams in this section are not eligible to nominate a team champion, and event selection will be any three members from the team.

6. Teams wishing to enter the Small Units section (max only) must meet the following conditions:
(a) The unit or company unit must employ less than 25 eligible people (men or women and including contractors), within a 25-mile radius of the location of the team entering.
(b) The team will compete in the main competition and must nominate a team champion who will compete for the individual title.

7. Teams not entering the Small Units section may consist of members of the company drawn from any location.
8. Contract staff may be used subject to the qualifying conditions.
9. Once a team entry has been accepted there will be no refund of the entry fee.

COMPUTASTARS ENTRY FORM

We have read and accept the conditions of entry and would like to enter:

Computastars	.....Men's team(s)	.....Women's team(s)	£39.50
Small units	.....Men's team(s)	.....Veterans' men's team(s)	£39.50
Computing 3 persons	.....Men's team(s)	.....Women's team(s)	£6
Computing 6 persons	.....Men's team(s)	.....Women's team(s)	£12.50
Computastar	.....Men's team(s)	.....Women's team(s)	£6
Computasprint	.....Men's team(s)	.....Women's team(s)	£6
Computatrek	.....Individual	.....Individual	£1
*Please delete as appropriate	.....Individual	.....Individual	£1

Computing 6 person teams will not be held at heats, UK final only.

Company..... Name of contact.....
Address..... Telephone.....
Signature of DP manager or equivalent authority.....
Position held.....

We would like to compete in the following region:

BARNLEY Saturday May 5
CRAWLEY Saturday May 9
BIRMINGHAM Sunday June 3
RNFIELD Saturday June 16

Please circle appropriate region.
Enclosed is £..... to cover entry fees for the team(s). Cheques should be made payable to Computastars Ltd.
In all matters relating to the rules or conditions of entry the decision of the organisers is final. Please send entry form with fees to Computastars, 1176 High Street, Croydon CR0 1QG. Telephone 01-688 6690.

DP's Olympics are about to start

COMPUTASTARS is here again. And what a competition. Bigger and better than ever, Computastars is now open to even the most unfit DP manager. Fear not if you find it difficult to lift a double gin and tonic, it is for you that Computastars has been brought into existence.

For alongside the ever-popular DP Olympics there will be a knockout darts competition for teams of three to five players.

But there is yet more. Not only is the ever-popular Computastars back, but a scaled-down version with three men (or woman) teams puts in an appearance for the first time. Aimed at the rank amateur player, the new competition promises to be one of the highlights of Computastars '84.

And in an attempt to find the fastest operator or programmer in the UK, Computasprint bursts upon the scene. Two races, of 60 and 100 metres, will be held at each heat, the winners going through to the UK final. Although

entrants can be members of the Computastars team, captains might well be wary of letting a vital team member risk all during the luncheon interval.

Not content with finding the fastest coder in the country, Computastars also aims to discover the DP person with the most stamina. At the end of each meeting a devil take the hindmost, or Computastar race, will be held. All the contestants have to do is run around the track. Simple enough, but at the end of each lap the tail ender will be removed from the field, until a single winner is left.

To summarise: Computastars, Computastar and Computasprint are the main elements of the competition. Entrants in each of these sections cannot enter either of the other main contests although they can go in for Computasprint and Computastar.

Clear? If you have any queries, don't phone us, phone Gordon. Calls on 01-688 6690.

See you at Barnley on May 5.

The rules of the competition

1. Teams will consist of not less than three and not more than five competitors.
2. Each team, other than a Veterans' team, is required to nominate a team champion who will compete for the individual title as well as being a member of the team.
3. The winning teams from each regional heat will be invited to participate in the national final. Additionally, the highest scoring Veterans and the highest scoring Small Unit team in each regional heat will be invited to participate in the national final.
4. The winning three men's and women's teams together with the highest scoring Veterans and Small Unit teams in the UK final will be invited to participate in the European final.
5. In each event, in each round three team members are required to compete; the nominated team

champion and two other team members nominated by the team captain.

6. The team captain must be one of the five nominated team competitors and the organisers will only recognise the team captain's selection for events.

7. Should the nominated team champion be unable to compete after the first event in a heat, then the team captain must nominate a substitute from the remaining team members. The substitute must continue to compete as the team champion in all remaining events. Once substituted the original team champion may not participate during the day's events. To win the individual title, a team must win the team event.

IF you have a query on Computastars, please don't contact us at Computer Weekly. Get in touch with the organisers at 1176 High Street, Croydon CR0 1QG. Tel: 01-688 6690.

the nominated team champion must compete in all events during the day.

9. Tie-Breaker: after all events have been completed, should there be a tie, then the winner will be decided as follows: team - the best performance in the last event where there was only one time/score recorded for the team; individual - the best performance in the last event where an individual time/score was recorded.

10. In the case of a dispute only the team captain will have the authority to represent the team.

11. At all meetings and on all points, the decision of the referee is final and not subject to dispute.

12. In all matters relating to the rules or conditions of entry the decision of the organisers is final. Please send entry form with fees to Computastars, 1176 High Street, Croydon CR0 1QG. Telephone 01-688 6690.

IBM-PC sales head for 20,000 in UK

by John Riley and Keith Holder

IBM Personal Computer sales failed to take off in Germany last year. Press reports say IBM sold only 7,000 PCs instead of the 16,000 it had aimed for.

But the UK is showing strong sales of the PC, mainly into large organisations. Estimates of the number of machines installed are as high as 9,000, and predictions on this year's sales top 20,000, according to IBM's dealer base. These figures do not include machines that IBM itself sells into large organisations. These could be as much as 30% to the sales figures.

The verdict of dealers like Hoskyns, Geisico and Byte Shop is that the IBM-PC will remain firmly attached to the business systems role, which will give it an enviable stability in the market-place.

Geisico's John Taylor says: "The IBM-PC is rapidly becoming the established standard for business micros; especially in large corporations."

One result of the German shortfall was the restructuring of

IBM Germany's marketing organisation recently. It has been divided into two units: the new markets unit, which is responsible for personal computers, videotex, telecommunications, robots, software and biomedical products; and the information systems unit, responsible for traditional markets and support.

Among problems reportedly facing IBM were low margins on the PC. Dealers pushed them only when specifically asked for them by customers, and the big distributors were slow to take on PCs because they feared losing out on the much more profitable replacement market.

IBM Germany would not comment on these reports except to say that it was "satisfied with the PC business it has had."

There were signs that the IBM and PC market was picking up in Germany late last year, particularly because, with problems at Osborne, Victor, Atari, Apple and David, buyers were turning to IBM for safety.

IBM aims to sell 60,000 PCs in Germany in 1984.

A few reasons why

Business Computers SEIKO series 8600	Intelligence in The City	IBM Research	Micro Modeller
apricot	Micro Find	IBM PC	Micro Broker
Micro Super Graph	ACT SIRIUS 1	PC EXPRESS	Training Division
ID Intelligence Distribution	Mailfile	Micro Linkline	WANG
Systems Division	Technical Centre		

Only the fit will survive

When you're making a decision about micros for your business, you have to be certain that the company you're dealing with has the kind of strength we can offer. A complete computer organisation with the resources today and the strength to serve you far into the future.

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You need to be offered a choice from the most advanced 16Bit computers available, IBMpc/Sirius/Seiko Series 8600/Apricot/Wang backed up by an effective after sales service, a research and technical centre, training, distribution and software, all co-ordinated by our systems division.

To know you are installing the right computer, you need a systems division, not only with our experience, but also with the ability to call on some of the best software expertise in the country.

In addition to our highly successful software packages for financial planning (Micro Modeller), information retrieval, business graphics, communications and insurance broking, we supply a large range of industry standard programs and word-processing packages, to ensure that the right system is selected for your business.

Our customers benefit from a strength that runs right to the core. Our technical centre and Intelligence Research, the innovators of the much acclaimed PC accelerator board, ensure the finest technical back up.

Our depth of knowledge and experience backed by our financial stability are qualifications you must insist on as you increase your computer commitment.

Telephone us on 01 740 5758 and we will show you a company and products that will impress you.

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The Complete Computer Organisation

Amdahl profit up 10 times at \$43 million

AMDAHL saw a remarkable improvement in its financial performance in 1983. Profit rose 10 times to \$43.2 million on turnover up 70% at \$777.6 million. Increased volume sales more than offset processor price cuts. In the fourth quarter profit was up from \$774,000 to \$15.7 million, and turnover ahead 55% at \$225 million.

President John Lewis expects further price reductions in 1984.

Harris boost

HARRIS has posted an 18% increase in profits for its second quarter ended December 1983, and says orders were up 30% because of a surge in demand for semiconductor products. Profit was up from \$15.6 million to \$18.4 million on turnover up from \$43.8 million to \$47.2 million. The figures include the results of Lanier Business Systems, which was merged into Harris in the same quarter.

Looking for home

MA BELL's orphans are looking for a home in London. The regional telephone companies formed in the break-up of American Telephone and Telegraph are seeking separate listings on the London Stock Exchange. Pacific Teleis and US West are the front runners.

Great debut

CML Microsystems has made a glamorous debut on the Unlisted Securities Market. Its shares managed a 58p premium over a starting price of 130p on the first day of dealings. At 188p the shares are on a prospective price earnings multiple of over 30, and value the company at £16 million — twice its capitalisation at the original tender price of 93p.

Ring for tickets

BARCLAYS Bank high technology group is sponsoring Barclays Technium, a high tech exhibition at the National Exhibition Centre, Birmingham. The show runs from February 21-25, and we have 50 complimentary tickets — street value £5 to give away. Ring 01-661 8541.

Buoyant Cray

A STRONG last quarter boosted net profits at Cray Research by 36% to \$26 million on turnover up 5% at \$170 million for year ended December 1983. Chairman John Rottwagen says the company met its target to install 16 new systems in 1983 — six of them were the new models, three Cray X-MPs and three Cray I/MS. Profit margins on these later models are much higher than on the old Cray machines, which were cut in price in 1982.

Micro takeover

EQUIPU, Bristol-based supplier of office equipment accessories and spare parts, has moved into microcomputer distribution with the takeover of Datalink Microcomputer Systems. Equipu inherits IBM-PC and Apple dealerships.

Cable puts its eggs in one colony

CABLE and Wireless wish to take control of Hong Kong Telephone Company has been granted. It now holds about 53% of the company's equity in a move that makes C&W alarmingly dependent on Hong Kong.

Cable and Wireless bought 35% of Hong Kong Telephone (Telco) for £143 million last March from troubled Hong Kong Land. Its latest bid was triggered when the group took a further 3.4% stake from the LI family, which has extensive interests in the territory. Under Hong Kong takeover rules, only holding over 35% necessitates a full offer.

So far the 13% C&W needed to buy to take a controlling interest has cost some £60 million. Buying 100% would cost C&W about £300 million. C&W finance director Ernest Potter has said that the company would not be distraught if it failed to get the lot, but leaving Telco with a substantial minority could store up trouble. The companies have disagreed in the past as to how to carve up the colony's international traffic revenues.

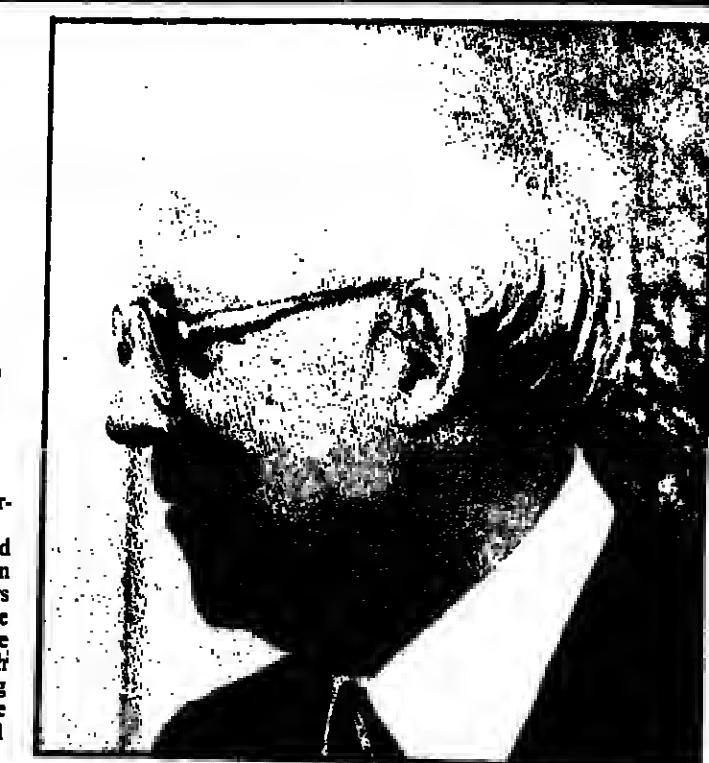
Some brokers had considered C&W's offer to be on the mean side and had advised shareholders against accepting it. Certainly the company has benefited from the downturn on Wall Street which took 50 points off the Hong Kong Stock Exchange. For its first stake C&W paid the equivalent of 11 times prospective earnings. Its current offer of HK\$46 (£4.14) represents 13 times earnings, and a modest premium of 12% over the price at which Telco was trading before the bid.

The deal gives Cable and Wireless virtual control of Hong Kong's telecommunications system. C&W already provides Hong Kong with its telegraph and international phone links through an 80% owned subsidiary Cable and Wireless (Hong Kong). Telco operates the domestic system covering Kowloon and the new territories.

The move is part of C&W chairman Eric Sharp's grand plan to dominate the telecoms market in the Far East, and China in particular. Sharp has said repeatedly that he sees China as one of the most important potential markets.

C&W has already made inroads into the Chinese mainland. In September 1982 it began a joint venture to provide telecoms facilities to China's fledgling oil industry. And last November it joined with provisional authorities to develop a telephone system for Shenzhen, a special economic zone on China's side of the Hong Kong border. C&W holds 49% of the venture, Shenda Telephone.

What may concern C&W shareholders is the company's dependence on Hong Kong while China negotiates to resume sovereignty over the colony in 1997. Cable and Wireless (Hong Kong) is the major contributor to C&W's Far East earnings — £50 million in the year to March 1983, and some 55% of the group's entire trading profit in that year. The offer shows great confidence in Hong Kong's political future — but does leave C&W looking something of a one colony company.



SHARP... "China one of the most important markets."

how to carve up the colony's international traffic revenues.

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Immediate runs into the red

IMMEDIATE Business Systems was among the 10 worst performers on the Unlisted Securities Market in 1983, and its latest figures do not suggest a far much better this year.

The company reports a loss of £1.23 million on turnover of £294,000 in the six months September 1983, against a loss of £790,000 on turnover of £206,000 in the same period 1982.

Immediate Business Systems has been warning since the year that its new technology, but its shares tumbled 20% to a new low of £1.23. The stock was placed by May & Addenbrooke at 90p and been as high as 33p.

The company makes quality assurance tests for an applications library running under Unix System V. AT&T has put its weight behind System V as the dominant strain of Unix by drastically reducing its price. The library is expected to consist of mainly third-party applications and systems software written by AT&T and Digital Research. It stressed that the arrangement is non-exclusive and AT&T would encourage others to write applications for System V that would not be included in the library.

AT&T's stance is something of a slap in the face for Digital Research's old rival Microsoft, which pinned its hat on Version V11 in the early days of the commercialisation of Unix. The Unix tide moved on leaving Microsoft to bring its Xenix product in line with System 111 and to integrate it with its single-user system MS-DOS.

The upgrade path from MS-DOS, which is used on the market-leading micro, the IBM-PC, to the multi-user Xenix has never been clear or simple. Microsoft will be pleased that IBM has plumped for System 111 on its PC under the label PC/IX, thus holding back the tide to System V. But Digital Research has opted to back a later version of Unix which could well become the vehicle of future Unix business.

"The System V market needs a focus," says Paul Bailey, vice-president of marketing for Digital Research. "The plan announced by AT&T shows it is committed to providing consistency. It has realised that Unix needs purification."

Digital Research has also been commissioned by Motorola to put its languages on to the MC68000 chip and by Intel to port System V to its 286 chip. Microsoft's scheme to do the job for Intel fell through.

For Digital Research, the System V implementation of its languages is the cornerstone of its strategy to provide languages and tools which are portable across all business environments, including the various forms of CP/M. Microsoft may well be feeling its nose is out of joint, having considered that its IBM-PC triumph had put Digital out of the race. Predictably it is playing down the importance of System V.

"Unix isn't going to eclipse MS-DOS," says Microsoft technical manager Phil Buggins. "Many users have now got used to their independence and won't want to be networked."

And a growing number of university and polytechnic computer graduates have advocated its use for commercial programming, but with little success.

Now a Croydon software house is to launch a series of Module-2 compilers which may give the language a considerable boost. Real-time Associates has re-written the academic Module-2 compiler for ETH University, Zurich, to run on DEC's PDP-11 minicomputers under the RT11, RSX and RSTS operating systems.

And it plans to follow these versions with one to run under Microsoft's Unix-lookalike Xenix, which has been absolute control over what his programmers do. "Import" and "export" verbs provide this structure and ensure that the layout of the program is organised in advance, not made up as you go along.

Software File is compiled by George Black

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SOFTWARE FILE

Digital Research tunes up C guide

by George Black and Claire Gooding

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AT&T's stance is something of a slap in the face for Digital Research's old rival Microsoft, which pinned its hat on Version V11 in the early days of the commercialisation of Unix. The Unix tide moved on leaving Microsoft to bring its Xenix product in line with System 111 and to integrate it with its single-user system MS-DOS.

The upgrade path from MS-DOS, which is used on the market-leading micro, the IBM-PC, to the multi-user Xenix has never been clear or simple. Microsoft will be pleased that IBM has plumped for System 111 on its PC under the label PC/IX, thus holding back the tide to System V. But Digital Research has opted to back a later version of Unix which could well become the vehicle of future Unix business.

"The System V market needs a focus," says Paul Bailey, vice-president of marketing for Digital Research. "The plan announced by AT&T shows it is committed to providing consistency. It has realised that Unix needs purification."

Digital Research has also been commissioned by Motorola to put its languages on to the MC68000 chip and by Intel to port System V to its 286 chip. Microsoft's scheme to do the job for Intel fell through.

For Digital Research, the System V implementation of its languages is the cornerstone of its strategy to provide languages and tools which are portable across all business environments, including the various forms of CP/M. Microsoft may well be feeling its nose is out of joint, having considered that its IBM-PC triumph had put Digital out of the race. Predictably it is playing down the importance of System V.

"Unix isn't going to eclipse MS-DOS," says Microsoft technical manager Phil Buggins. "Many users have now got used to their independence and won't want to be networked."

And a growing number of university and polytechnic computer graduates have advocated its use for commercial programming, but with little success.

Now a Croydon software house is to launch a series of Module-2 compilers which may give the language a considerable boost. Real-time Associates has re-written the academic Module-2 compiler for ETH University, Zurich, to run on DEC's PDP-11 minicomputers under the RT11, RSX and RSTS operating systems.

And it plans to follow these versions with one to run under Microsoft's Unix-lookalike Xenix, which has been absolute control over what his programmers do. "Import" and "export" verbs provide this structure and ensure that the layout of the program is organised in advance, not made up as you go along.

Software File is compiled by George Black

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Digital Research tunes up C guide

by George Black and Claire Gooding

GUIDELINES on the C language due within a fortnight herald the start of Digital Research's collaboration with AT&T on a Unix library.

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Midlands catch on to new techniques

by John Riley

NEW software techniques are catching on in the Midlands, according to a survey conducted by Birmingham software house Kalamazoo Business Systems.

Kalamazoo canvassed 500 Midlands data processing managers last autumn to draw up a picture of systems and programming resources in the region because it considered that national surveys were biased to the south of England.

Doug Brown, Kalamazoo's manager for group development, who organised the survey, says the main finding was that just over half of the 125 respondents either use or plan to use structured programming techniques and that 40% of them use or plan to use new analysis and design techniques.

Nearly 60% of the DP managers who replied are finding it difficult to recruit staff for systems and programming maintenance. About the same number predict that there will be a shortage of general systems and programming skills in the short to medium term.

The 125 respondents used 25 different programming languages between them, with RPG, IBM's own small systems language, being the most significant generative language. Cobol was the most important language (used by 73%), followed by Basic and Assembler. "Survey of Midlands Data Processing Managers, Kalamazoo, Price £11.50. More information on 021-475 2191."

Scan Data bought in £2.2m deal

SCAN DATA International, the Texas Instruments systems house and microcomputer distributor quoted on the Unlisted Securities Market, has been bought by Audiotronic Holdings, itself a public company and communications equipment supplier.

Martin Baldwin, chairman of the company, and Gartmore Investments, which account for 56% of Scan's equity between them, have accepted the £2.2 million share offer.

Audiotronic is putting up nine of its own shares for every two in Scan. Audiotronic is trading at 22p, so that value Scan shares at 99p. The bid is fully underwritten by cash, and Schroeder Wagg, Audiotronic's advisor, is offering shareholders a cash option of 21p.

Scan placed a hard time in 1983. Shares by Williams de Broc at 125p, they have been as high as 197p. But last month they had tumbled to a 75p low before being talked up 15% as speculation about a bid surfaced.

Baldwin concedes: "It would have taken some time for Scan to get its glamour back on the USM," and Audiotronic offers the company far faster growth than would have been possible over the long haul.

Baldwin says the decision to join up with Audiotronic has not been easy but he is confident that "it is the right thing for all concerned. I've been pretty impressed with Audiotronic's plans and they have a lot of clout in the City".

Baldwin reveals that Audiotronic approached Scan over Christmas. The company already has a small telecommunications business, Eagle, and, according to Baldwin: "It is intent on moving into the business in a big way. For that it wanted a computer capability, and it has found one that fitted."

Scan produces turnkey system on Texas Instruments minicomputers. It handles Onyx micros and recently won exclusive distributorship for Toshiba's microcomputer range.

Baldwin moves on to the board of the new group and the Scan name stays. Audiotronic will have to issue 10 million new shares in the acquisition, and it intends to place five million more to raise one million for research and development and working capital.



BALDWIN... "Right for all."

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Takeover gives boost to Grand Met

by Philip Hunter

ALMARC Data Systems has risen again from receivership under the ownership of Southampton-based High Technology Electronics, (HTE), maker of circuit boards and other electronic components, after a takeover for an undisclosed cash sum.

Almarc was an OEM, importing 16-bit circuit boards from the US to build a micro called Spirit, and the significance of the move is that it gives HTE's parent company, the Grand Metropolitan Group, the capacity to build complete systems.

Grand Met is the UK's 10th largest company, and turned over almost £4 billion last financial year. HTE projects sales of £4 million for year ending September 1984, but managing director Tim Roberts says the Grand Met Group is making substantial investments, and HTE is drawing up a shopping list of computer companies to buy later this year.

HTE and its newly-acquired Almarc subsidiary will combine on systems manufacture, and already HTE has added the Arcnet networking capability to the 16-bit Intel 8086-based Spirit, which runs the Concurrent CP/M operating system.

SOFTWARE FILE

National puts on a new program

ACTRESS Frances de la Tour will be one of the first names to be read by a new system at the National Theatre this week. She is taking the title role of the theatre's new production of *Saint Joan* with a cast which will be among the first payee's of the custom-written software. The program was written by Interactive Computer Systems (ICSL) of Sidcup in Kent, and runs on a Data General MV4000 minicomputer.

APL proposal

THE draft proposal for a standard for the APL language has been laid open for public comment from March to the end of June by the American National Standards Institute's information processing systems committee.

Softword comes

SOFTWORD Systems of Connecticut, author of the Wang-like word processing package for the IBM-PC Multimate, will set up in the UK next month. The two year old \$15 million firm will open a distribution and support centre in the London area.



POWELL... Says requests for help were fruitless.

Home suite suits go-it-alone PME

By Claire Gooding
WANG software house PME is to go it alone with a home-grown suite of accounting software after years of selling US-based software. Since 1981, PME has been the UK distributor for The Office Manager (TOM), a parameterised set of accounting modules for the Wang 2200.

Now PME has developed its own software and is planning to concentrate on Wang's larger VS machine. PME's Complete Accounting System, while it has its roots in TOM Software, has been mainly coded by PME, and enhanced to the degree that it is a new product for the VS market.

PME is still fulfilling its contractual obligations to TOM, despite a declaration last year by TOM president, Howard Bing, that TOM had unilaterally terminated the PME contract. PME is still sending regular reports and royalties to TOM, although joint man-

aging director Naomi Langford Wood says that PME has not heard from TOM for some time.

Like many UK distributors of products which originate in the US, PME has put in a great deal of time and effort supporting TOM software for the UK. Since no help came from TOM, it made its own enhancements.

According to PME director Mike Powell, not one enhancement or update was received, and requests for technical support were fruitless.

"There was an enormous amount of detail to change," says Powell, "not to mention basic enhancements users needed such as daily rather than monthly postings."

PME went ahead and extended the software on its own account, adding a range of applications such as property management, travel agents' packages, property development accounting and govern-

mental commitment accounting.

There were also problems adapting to the UK account conventions, which PME did and then added multi-currency facilities, box graphics, support extra terminals and integrate with other software.

The decision to expand on VS was, according to Powell, perfectly logical business decision to expand rather than a debate move away from TOM or 2200.

"The VS is a Cobol machine and effectively the software was machine independent. We providing a VS service, that is where the marketplace, and since Wang has decided, Unix, it opens up the possibility of an even larger market in the future," he asserts.

In the long term, PME plan transfer The Complete Accounting System to other manufacturers such as IBM.

ICL sells Lucre rights

ICL HAS sold its rights to one of its major applications packages. London software house Pentagon Business Systems has acquired the successful Lucre accounting package and is busy preparing a version to run under the VME operating system ready for the launch of ICL's VME-based DM1 machine expected later this year.

The system's user group heard last month that Pentagon will support its 60 members, which include Curry's, Plessey, Thames TV and Spillers. It is also used in Australia, South Africa and Saudi Arabia.

The decision by ICL to let Pentagon take on one of its major applications reflects the firm's growing recognition of the crucial role of applications in selling machines.

In particular ICL bosses are

anxious to avoid repeating early dearth of usable packages which dogged its 2900 series. Some Lucre users felt a wholehearted commitment was doubtful as it wanted to avoid the clash with other package such as MGB Ledgers.

Pentagon managing director Carl Cushnie promised the group that his enhancement would give them upwards compatibility throughout ICL's hardware range for the first time.

As with Pentagon's previous adoption of ICL's Ordis order processing package, ICL will continue to receive royalties.

By November Cushnie intends to have both Lucre and Ordis running under VME. Lucre, which began life in France, was a big hit and cost tax Pentagon's small staff.

Sensible differences end in row

By Claire Gooding
DIFFERENCES of opinion over the marketing of the Sensible Solution database have caused a split in the UK exclusive distributor of the product, Offshore Computing.

Marketing director Brian Young has left and is talking with O'Hanlon Computer Systems of Seattle, the originator of the database, about setting up an outlet in Europe. Young was instrumental in signing the original deal between Offshore and O'Hanlon.

The Sensible Solution is a sophisticated database and applications generator. It uses the data dictionary approach with other techniques which make it more flexible as well as more powerful and faster than most microcomputer database tools.

Sensible has been doing well in the wake of less powerful tools such as Ashton Tate's dBase II and has been doubling sales every month in the US.

Offshore refers to "the sudden departure" of Young in its announcement of new marketing plans for the Sensible Solution.

The company has abandoned its original plan to sell only to end-users, and provide all support from its Porters Bar headquarters.

It is now looking to recruit a national network of dealers who can prove the ability to support the product. Offshore is also approaching OEMs and distributors wanting to run the database.



YOUNG... Sudden departure.

"Our present plans are a compromise of the original plan of having no dealers," says Offshore's new marketing director Bill Miley.

"Dealers, software houses and applications developers have proved they can handle the product by putting out specific applications. We have already developed our own. We hope this approach will assure users of the best support and give the Sensible Solution degree of exclusivity, unlike dBase II which can be bought in any outlet."

The broadening of Offshore's marketing plans has reassured O'Hanlon Computer Systems, which had some qualms about the original, more exclusive plan.

President Pat O'Hanlon says that his company is up a European network stresses that this is no way arduous its relationship with Offshore, which remains its UK distributor.



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PROFILE

The man who delivered two body blows to industry giant

PETER HERMON, the newly-appointed UK managing director of Tandem Computers, is remembered for giving IBM two massive body blows in the 1970s. The repercussions of those blows, which helped to get IBM plug-compatible and third party maintenance companies off the ground, still reverberate around the UK computer industry.

As management services director and head of British Airways computer operations he first switched the maintenance of his IBM 370/158-based installation away from IBM to the Australian-based third party company, Data Processing Computer Equipment (DPCE). Then two years later, in 1978, he left IBM altogether by

upgrading his machines with plug-compatible AMDahl mainframes. "Taking maintenance to DPCE saved us 30%," he says. "The decision to break away from IBM was bold, and it effectively launched AMDahl in the UK, as well as saving British Airways 'millions' of pounds."

What isn't so well known is that Gill Jooes, IBM's president of world trade, later wrote to Hermon thanking him, because he had pointed IBM in the right direction for the future.

In 1982 Hermon was made managing director of British Airways European operations, and left last summer after re-organisation in preparation for privatisation. He did consultancy work for Satchi and Satchi for a while before being headhunted into Tandem, the US manufacturer of fault tolerant

minicomputer systems. He is enthusiastic about Tandem. "It is not cluttered with traditional and outmoded practices and has an open style of working. For example, at Tandem's terminal factory in Austin you don't see an assembly line. Every worker makes the whole product and signs it - that ensures built-in quality assurance. "Being in a large organisation is like trying to swim in treacle, whereas now most of my time is spent swimming in water."

Although he comes from the public sector, Hermon has much to offer Tandem, for British Airways' software was marketed throughout the world and won Hermon a Queen's Award for Export Achievement in 1982.

Ten years earlier, in 1972, he won a Queen's Award for British Airways' communications network called Boadicea.

"Our software sales paid for our hardware," he says. "Our prime focus was online systems and distributed databases. We had the first real time system in the UK. Now a lot of companies are beginning to use real time systems. That is the area Tandem excels in."

Another important area for Tandem is the public sector. According to Hermon, about one-fifth of its UK sales are currently to that sector, and Hermon will push hard there.

Tandem is a rapidly growing company, and has doubled its turnover each year in the UK since 1978. One of Hermon's tasks will be to "help Tandem bridge the gap between a small entrepreneurial company to a more mature one."

But he realises that there must be a delicate balance: "We're



HERMON... "The whole pace will get much faster."

going to have to put more structure, more procedures and guidelines than in the past, but that doesn't mean red tape," he says. "You need enough cement between the bricks, and that takes judgment and skill."

How does he view running a company of 160 staff after being responsible for 3,000 people? "It's not all that different," he says. "The kind of controls needed for large and small companies differ only by the number of noughts."

"Inventories, cash flow, margins, long-term planning, etc, are all common to each - there are the same people problems: communications problems and interface problems."

After leaving Oxford with a first in mathematics in the mid-1950s, Hermon joined the staff of Leo, the UK's first commercial computer (Lyons Electronic Office), which was a breeding ground for many of the computer industry's leaders.

He moved from there to bead Dunlop's management and computer services division, joining BOAC as director of information handling in 1965.

"BOAC was in the Stone Age as far as computers went then," he says, with IBM 650 and 1410 machines. He upgraded to IBM 665 machines and set up Boadicea and software facilities.

Ironically, in the early 1970s, Hermon championed IBM. The 1972 merger of BOAC and BBA caused severe problems in the DP departments, because BOAC had IBM machines and BBA ran Univac. Hermon won the resulting battle and British Airways invested in two IBM 370 machines.

PLATFORM

Risks and rewards of the cable era

THE onset of the "cable era" has been heralded by a fanfare of speculation on whether the introduction of interactive services in Britain will prove profitable, or whether a number of entrepreneurs will get their fingers burned.

But much of the controversy is centred around the entertainment facilities provided by cable, and relatively little has been said about the business applications of the new technology.

For large business users cable will have only minor importance, at least in the short term. Already well served by the public switched telephone network, as being upgraded by British Telecom in its move towards an integrated services digital network, such users are relatively sophisticated and will require a reliability of service and ease of use which may be difficult for first generation cable systems to provide.

All is not lost in the longer term, though: cable has the potential to offer large businesses the benefits of high speed data connections in BT premises in city centres or Mercury Communications' centres - plus faster and more economical provision of "in" connections for confabulation and facsimile.

Add to this the possibility of cheaper telephone calls provided by Mercury's long distance network, and cable has definite potential for future growth in the large business market.

As far as small businesses are concerned, however, the story is entirely different. The first obvious application is as a substitute for telex: there are only about 100,000 telex subscribers in the UK at present, compared with an estimated total of almost three million business telephone subscribers. Few of this massive shortfall use facsimiles, either, which leaves an enormous and immediate potential market for a low-cost high-speed data transmission service. And for many such small businesses, a lower-cost telephone service would imply a significant

reduction in overall operating expenses.

Small businesses would do well to consider the use of personal computers, primarily as devices for text transmission and a ceptrina. This could be a major step towards an easy-to-use electronic mail service which will rapidly approach the ease and convenience of a telex network - and which will interconnect with that network.

The system may have to start as simple mail-box facilities, but there are obvious advantages in developing a system which gives automatic confirmation that a message is received and facilities for immediate response.

Person-to-person message interchange, as provided by telex, may be a obvious starting point, but alternative cable has many other applications in the small business market. Ready access by small companies to remote, larger computers is a good example.

Match has been made of electronic mail under facsimile. Equally, the electronic monitoring of dispersed point-of-sale terminals and various types of electronic funds transfer have been made as advanced - or Big Brother - applications.

It is worth noting, though, that all of these financial services require some degree of authorisation and verification: this could be simple identification of the caller terminal, or personal identification number entry and credit verification.

Cable is a high risk business and the industry will have a lot of backers who are willing to part with millions of pounds on the line to start-up finance. But the business applications of the system are such that potential return in the sands of millions would not be under-optimistic.

Software copyright will remain a fuzzy area in this country at least until the government does something about introducing the legislation it has promised. In the meantime, data processing managers would do well to take a close look at their own policies.

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ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, February 16, 1984

Is there a pirate in your company?

LARGE end-users of popular computer software packages have been warned: copy at your peril.

Lotus Development Corporation, the US company which developed the highly successful spreadsheet package, has filed a \$10 million lawsuit against a subsidiary of the giant Schlumberger group. The suit alleges that a US company, Rixon, made copies of discs and manuals for the 1-2-3 package and distributed them to branch offices.

Software piracy has been a hot issue in the computer industry for some years. Most of the attempts to stamp it out, however, have been aimed at commercial companies which have been re-selling software for profit.

Many software firms have turned a blind eye to the copying of software in user installations. It is a difficult area to police, and most suppliers obviously feel that accusing users of engaging in illegal acts is not the way to ensure a long-term market for one's products; the customer might become so offended that he would take his business elsewhere.

The widespread use in the corporate environment of products like 1-2-3 and Visicalc has changed the equation. Although Lotus, which has sold an estimated 150,000 copies of its spreadsheet, has not been unduly hurt by the alleged copying, the principle is important enough to take a stand on.

UK users probably do not have to worry for the moment, since the government has still failed to fulfil its promise of new copyright legislation. Users, however, might do well to consider their own policies on copying of software.

A corporate stance which condones copying might have unexpected side effects in, for example, the area of computer security. Many computer users who find it acceptable to copy the odd 1-2-3 or Visicalc package might look askance if one of their data processing staff left with internally developed software and shared it with a competitor.

Some departments in the public sector here and abroad have been known to set a particularly bad example. Clearing houses have been set up to distribute copies of software packages to various departments, and in at least one case, a software house was called in to give support for a product which had not even been purchased.

Software copyright will remain a fuzzy area in this country at least until the government does something about introducing the legislation it has promised. In the meantime, data processing managers would do well to take a close look at their own policies.

Tebbit is right

SECRETARY of State for Trade and Industry Norman Tebbit made a spirited defence of free trade policies when he spoke to the US Chamber of Commerce in Washington last week. He also made clear that the UK would not accept the right of the US to impose its laws on UK companies operating on UK soil.

Tebbit's remarks were spurred by the recent letter from IBM to UK customers of its advanced computer systems. The letter said UK companies were subject to US export legislation if they transferred ownership of the equipment.

Tebbit told the Chamber: "Let me mention first the most persistent source of tension between us: your claims to be able to impose your laws on people in other countries, inside their own homes and their businesses - what we call extra-territoriality and what over here is sometimes referred to sardonically as Conflicts of Jurisdiction."

These US practices, Tebbit said, are unacceptable. We agree. The arrogant US belief that it can control the world - or make the world safe for democracy, as the saying used to go - has long been discredited. Unfortunately, the US people have a President who is particularly adept at playing on their paranoia of a "red in every bed".

There are two important issues at stake: free trade, which includes free technology transfer; and control of advanced technology going to the Eastern bloc. The two are being entangled to the detriment of both.

1984 and all that... THIS week's example of the strange things people say about computers was sent in by J. A. Haymer, of Braunstone, Leicestershire, who wins £5. Accessories for computers are called "software" and that includes things like cassettes and catalogues.

LETTERS

Calling all Apple users

MAY I draw the attention of readers to the monthly meetings of the Croydon Apple User Group, which aims to widen users' knowledge about both their machine, its diverse applications, and other users?

We have a pool of expertise in many fields, and always are looking for new members to broaden our horizons. For details please phone our secretary Roger Laming on 01-681 6842 any time.

P. C. V. RAMAGE
Croydon Apple User Group.

Confusion

MAY I clear up the confusion regarding Philips digital PABX revealed in Anthony Kenyon's article in the January issue of *Management Review*.

Our offering is designated TBX 3000 not TBX 8000. The confusion has arisen, I believe, from the fact that Philips analogue switch is called the BBX 8000.

COLIN AINGER
Press and PR manager
Philips Colchester.

Interesting girls in IT

I WAS interested to read the article *Crusaders Want More Women* by Nuala Moran (*Computer Weekly*, January 26) and would like to give some information on what the London borough of Croydon is doing.

In the spring of 1983, five teachers from Croydon, following a great deal of research, wrote a document, *Information Technology in Schools*, which was published by the Equal Opportunities Commission. Last month a copy of the document, as part of a package, was sent to every secondary school in the country. The package also contains a poster, *Girls in IT*, a computer comic, *Load Runner*, where boys and girls share equal status, a leaflet showing job opportunities for girls, a booklet, *Working with Computers*, which portrays the qualifications and jobs of a number of girls in computing; and a newsletter from F International, a systems company run by women. The package can be ordered from Frank Smart, Publicity, EOC, Overseas House, Quay Street, Manchester, M3 3HN.

The information which the Croydon teachers obtained covered computer education from primary through secondary school. It was found that, in the primary

Information Technology in Schools also contains statistics, questionnaires, surveys and classroom observations. Croydon is continuing its interest in girls in technology. It is jointly funding, with the EOC, a two-year project on girls and IT at the Davidson Centre. It is hoped that by the end of this period the awareness level of parents, teachers and pupils will be raised so that girls will be encouraged to realise their own potential in this rewarding and extremely important field.

(Mrs) ROBIN WARD
EOC project director
Davidson Centre
Croydon.

First in data protection

I READ with some interest Nuala Moran's article on Lambeth Council's decision to appoint a data protection officer (*Computer Weekly* January 26).

Lambeth is to be congratulated for taking this step which shows a recognition of the difficulties facing local authorities when implementing the proposed DP Act. Advice to consider such an appointment was given to all local authorities by Lamsac at its London seminar held in March 1983.

I must point out, however, that whereas Lambeth may be the first London borough to make such an appointment it is not the first local authority in the country to have done so.

This honour, if honour it is, belongs to one of several local authorities which already had an officer in post when the Lambeth advertisement appeared.

The notes of praise contained in the article apply to many other local authorities which have taken an equally responsible attitude to data protection.

ROY BARNES
Director
Lamsac
London.

FOR D.P. AND I.T. MANAGERS

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INFO 84. The once-yearly, four-day opportunity for DP and general management alike. Join them this year, and discover the practicalities of costs and the implications of today's office technology.

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PUZZLER

THIS table sets out a "pouring" problem, in which you start with four containers (respective capacities 9, 9, 4, 5 litres), the two larger ones being full and the other two empty. This "state" is shown as 9-9-0-0.

The task is to reach a 7-7-2-2 state in only nine pourings (the question-marks conceal the situation in the larger containers). See page 78 for solution.

10 YEARS AGO

FROM COMPUTER WEEKLY OF FEBRUARY 14, 1974: The first of a stream of ICL New Range computers to be acquired by UK universities was to be installed at Bath University.

Mohawk Data Sciences planned to enter the OCR market... Den Picher, Univac managing director in the UK, was appointed general manager and vice-president of the London-based European division of Sperry Univac.

President of Honeywell, Stephen Keating, took over as chief executive officer from James Binger... Orders for Datamark OMR equipment were running at £1 million a year, the company reported.

Norwich City College claimed that its 64K ICL 1904A with VDUs and teletypes for up to 31 simultaneous users was the biggest single system in UK polytechnic... Honeywell's take, rental and service revenue for the year rose 12% to £46 million.

10 YEARS AGO

DOWNTIME

A trade that sets up teenage tycoons

NOW here's a sign of the times. No-one under the age of 16 will be admitted to Softcon, next week's giant software trade show in New Orleans, unless that individual is the president or executive officer of an exhibiting company.

No, they aren't kidding. Show producer Gerald Milten estimates that 3 to 4% of program authors are aged 15-21 and several of the 500 firms involved in Softcon are headed by teenagers. Whereas the average age of computer staff is

said to be 30, that of the software branch is 23. Jeff Gold, president of Double Gold, in San Jose, is 17 and still at school, while earning over \$100,000 a year.

David Wagman, chairman of the big US distributor, Softsell, is 31 - they call him "Gramps". Howard Marks and Bob Kotick, founders of Arktronics in Michigan, are 20 and they aim to turn over \$6 million this year. Milten himself, way over the hill at 41,

That's really rubbing things in

OPERATORS have always had a rather less enviable reputation. Famed for dragging their knuckles along the floor as they walk, and loading the wrong media at every opportunity, ops are traditionally looked down upon by more important employees, such as toilet cleaners.

Living proof of the esteem in which this unhappy breed is held comes in the form of a course from ADP. "Motivating Operations Personnel". The whole course lasts 60 minutes.

That's just about time enough for ops managers to learn how to wield a big stick. And even siller is a course from IBM, expert Kepner - "Converting to MVS". Duration? Two days. Come off it Kepner, everyone knows two years is more like it.

What's in a name (cont.)

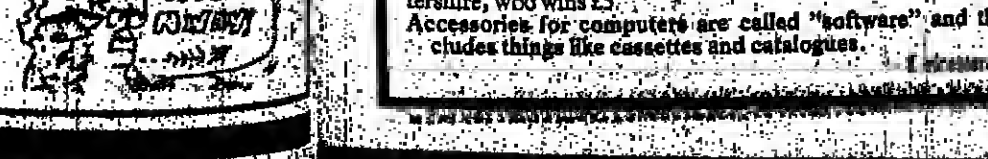
WHAT'S in a name? Recently we've been keeping you in touch with some of the more ironic marriages of job and surname.

There was a certain Peter Iron who was a director of the Lotus Development Corporation. Then there was my friend IBM who masterminded the amazingly endless postponement of his company's disc storage system who went by the name of Delay.

Well, the gallery is swelling. A member of that occasionally over-enthusiastic profession, the relations, had a letter published last week within our own ranks. His name? Mr Puffett.

And to cap it all, one of our intrepid reporters last week unearthed a Moscow spokesman by the name of Mr Voice.

Chin



All about protocols

Fred Jennings, of software and systems house Data Logic, has prepared a series of reports on network protocols - called Jensheets - and the eighth of these is on communications protocols. Due to space restrictions we are printing it in five instalments, of which this is the fourth.

THE following full-duplex protocols are the most well known:

■ Digital Equipment's Digital Data Communications Message Protocol (DDCMP) is the line protocol used for DECNET and is an unusual full-duplex protocol because it is control character oriented.

■ IBM's Synchronous Data Link Control (SDLC) is a bit-orientated protocol and has a similar frame format to HDLC. SDLC is the line protocol used for IBM's System Network Architecture (SNA).

■ the International Standard Organisation's (ISO) High-Level Data Link Control (HDLC) is a bit-orientated protocol and is directly equivalent to the American National Standards Institute's (ANSI) Advanced Data Communications Control Procedures (ADCCP). A subset of HDLC is used as the line protocol for CCITT X.25.

Full-duplex protocols require a full duplex point-to-point link. They all use a form of piggy-back operation for acknowledgements (ACKs), and ACKs to correctly received (incoming) data blocks are transmitted as a field in outgoing data blocks.

When there is no data to send, then acknowledgements are sent separately in non-data blocks. To avoid any ambiguity as to which data blocks are being acknow-

ledged, each transmitted data block has a send sequence count of three bits (counts 0-7). Some full-duplex protocols provide an extended send sequence count capability of seven bits (counts 0-127).

For each data block transmitted, the send sequence count is incremented. The count is circular and the next count after seven (or 127) is eight.

An acknowledgement consists of transmitting a receive sequence count which is the expected send sequence count of the next data block to be received. All data blocks received up to that number are acknowledged.

The frame structure for the High-Level Data Link Control (HDLC) protocol is specified in British Standard 5397 (ISO 3309, ECMA 40) documents as Table 1.

This is the LONG frame format and there is also a SHORT frame format which is identical except that it does not have an information field.

Error-checking on frames is achieved by the use of a frame-checking sequence (FCS) which is generated using the CCITT CRC-16 polynomial. The CCITT CRC-16 is a different polynomial to the IBM CRC-16 used in binary synchronous operation.

For HDLC operation, a cyclic redundancy check is a division performed by both the transmitting and receiving devices using the numeric binary value of the Address field, Control field and Information field (when present) as the dividend which is divided by a 16-bit constant (CCITT CRC-16).

The quotient is discarded and the remainder is used as the frame-checking sequence (FCS) is CRC character. It should now be realised that one of the advantages of HDLC is that all transmission (data and non-data) use frames and are therefore protected by a CRC check.

HDLC is a bit-orientated protocol and two bit patterns are used for basic transmission control purposes: a bit pattern of 01111110 is called a FLAG and is used to mark the beginning and end of each frame; a bit pattern of seven to 15 consecutive ones is an ABORT function and is used by the transmitting device to abort a frame which has started to transmit.

Transparency of the data in the address, control and information fields is achieved by a technique which is known as "zero bit insertion/deletion" (bit stuffing/unstuffing). Zero bit insertion is performed at the transmitting end and zero bit deletion is performed at the receiving end. The transmitting end inserts an extra nought into the transmit stream if it detects a six-bit serial pattern of 0111111 because the next two serial bits could be 10 (a pseudo flag) or 11 (a pseudo abort function). The receiving end performs the reverse operation and deletes the final nought on any received serial pattern of 01111110.

At the transmitting end, genuine FLAG and ABORT bit patterns bypass the zero bit insertion/deletion and are therefore uniquely identified at the receiving end. Zero bit insertion/deletion is a hardware feature of an HDLC Communications Interface.

The bit-orientated HDLC/SDLC protocols and the character-orientated IBM BSC protocols differ in their hardware interface requirements as shown by Table 2.

Data General provides different hardware interfaces for HDLC and BSC operation but Hewlett-Packard has an interface capable of either operation (HP Intelligent



"I told you to look at packet-switching not packet-carrying!"

Eight bits Flag	Eight bits Address	8/16 bits Control Information	16 bits FCS	Eight bits Flag
Character synchronisation	Leading FLAG	HDLC interface	IBM BSC interface (using EBCDIC)	
Text transparency	Bit insertion/deletion	Two SYN characters	DLE-STX, DLE-ETX etc	
CRC generation/checking	From leading FLAG to end of information field using CCITT CRC-16	From SOH or STX to ETB or ETX using IBM CRC-16		
Detection of end of frame/block	Ending FLAG, CRC is two previous characters	ETB or ETX, CRC is two following characters		
Abort frame	7-15 ones	Not provided		

Eight bits Flag	Eight bits Address	8/16 bits Control Information	16 bits FCS	Eight bits Flag
Character synchronisation	Leading FLAG	HDLC interface	IBM BSC interface (using EBCDIC)	
Text transparency	Bit insertion/deletion	Two SYN characters	DLE-STX, DLE-ETX etc	
CRC generation/checking	From leading FLAG to end of information field using CCITT CRC-16	From SOH or STX to ETB or ETX using IBM CRC-16		
Detection of end of frame/block	Ending FLAG, CRC is two previous characters	ETB or ETX, CRC is two following characters		
Abort frame	7-15 ones	Not provided		

Table 2
Network Processor). The secret of HDLC operation lies in the coding of the eight bits of the Control field. For an information (long) frame, the eight bits of the Control field are interpreted as follows:

Bit 1 = 0 indicates that this frame is an information (I) frame. Bits 2, 3, 4 = Ns = Send Sequence Count (identifies this I frame). Bit 5 = P/R = Poll/Final bit. Bits 6, 7, 8 = Nr = Receive Sequence Count (Acknowledgement of received frames up to Nr-1).

For a short Supervisory frame, the eight bits of the Control field are interpreted as follows: Bits 1, 2 = 10, indicates that this frame is a short supervisory frame. Bits 3, 4 = S = Supervisory Functions bits.

00 = Receive Ready (RR)
01 = Reject
10 = Receive Not Ready (RNR)
11 = Selective Reject (SREJ)
Bit 5 = P/R = Poll/Final bit
Bits 6, 7, 8 = Nr = Receive Sequence Count

For an unnumbered frame, the eight bits of the Control field are interpreted as follows: Bits 1, 2 = 11, indicates that this frame is an unnumbered frame. Bit 3 = P/R = Poll/Final bit. Bits 4, 5, 6, 7, 8 = M = modifier-function bits.

Unnumbered commands:
11000 Set Asynchronous Response Mode (SARM)
11010 Set Asynchronous Response Mode Extended (SARME)
11001 Set Normal Response Mode (SNRM)
11011 Set Normal Response Mode Extended (SNRME)
11100 Set Asynchronous Balanced Mode (SABM)
11110 Set Asynchronous Balanced Mode Extended (SABME)
11001 Reset (RST)
11001 Frame Reject (FRMR)
00010 Disconnect (DISC)

■ Three types of stations: Primary stations, Secondary stations, Combined stations.

■ Three types of data flow: collection, data dissemination, both: where information frames flow from Secondary Primary only, from Primary Secondary only, or both, respectively.

■ Two types of transmission: point-to-point and multipoint (to be explained).

■ Three types of configuration: Unbalanced (for Primary Secondary station), Symmetrical (for superimposed Primary Secondary station), and Balanced (for Combined stations).

■ Two sizes of modulus: eight 128 for sequence counts.

These classes of procedure are summarised below.

Designation Class of procedure description
UAB Unbalanced operation, Asynchronous Response Mode, Modulo 8
UAB Unbalanced operation, Asynchronous Response Mode, Modulo 128
UNB Unbalanced operation, Normal Response Mode, Modulo 8
UNB Unbalanced operation, Normal Response Mode, Modulo 128
SAB Symmetrical operation, Asynchronous Response Mode, Modulo 8
SAB Symmetrical operation, Asynchronous Response Mode, Modulo 128
SAB Balanced operation, Asynchronous Response Mode, Modulo 8
SAB Balanced operation, Asynchronous Response Mode, Modulo 128

Classes UAB, UAB, UNB, UNB can be used in Unbalanced configurations. Classes SAB, SAB, UNB and SNE can be used in Symmetrical configurations. Classes SAB and SAE can be used in Balanced configurations.

Next week, we will move on to operational modes in the fifth and final instalment of this communications protocols series.

COMPANY PROFILE

Dedication is still the Wordplex way

Many think dedicated word processors are outdated. Wordplex, as Nuala Moran discovered, thinks not, despite introducing its new micro

WHEN Wordplex introduced its micro at the end of January it made it quite clear this did not mean it was abandoning word processors. There are probably some commentators who think it would be better off if it did.

The argument goes something like this: a word processor is merely a small computer, distinguished by the fact that its software suits it for one function. But users have no need to be restricted in this way.

They can buy an ordinary business micro, probably for slightly less than a word processor, which is entirely appropriate for word processing and lots of other things as well. Ergo, the end of dedicated word processors.

Wordplex does not see it in the same way. It says there is a world

to another. "And," says Winder, "you've got to remember that word processing is an expensive function. Having a purpose designed word processor means saving training time and it also means greater productivity."

Winder also disagrees with the pundits' view that it is only the large companies with centralised typing pools which can justify machines dedicated to doing word processing.

"Lots of small users such as solicitors are still going for word processors. This is because one of the main clerical tasks in a solicitor's office is producing documentation. So, they want to invest in the most efficient method."

A friendly operator interface has continued to distinguish word processors from micros. And because dedicated word processors are designed and built for continuous use it is possible to justify the extra cost. But Wordplex has realised it cannot depend on these features for its continued existence.

As a result it has designed an office automation strategy, which is where its business micro comes in. The micro is an IBM-compatible machine, made by Corona Data Systems. This is the first time Wordplex has marketed a machine not made at its own factories.

These are three micros on offer, a standard personal machine with 128 Kbytes of RAM; the XT which is internally identical to the personal computer, but has a 10Mbyte Winchester disk drive; and a transportable model with the same specification as the PC but with its screen shrunk to nine inches and weighing only 20lbs.

Wordplex's bid to become a supplier of complete systems for office automation will be rounded out with an additional offering, expected soon, of a file/resources network connector. System 8000 will allow micros, word processors and peripherals to be used as a distributed system and to connect to a local area network.

Winder emphasised that the micro is an executive too. It is not intended to replace the word processor. But in defining a

strategy for office automation, Wordplex also realised that it had to increase the functions of the word processor.

"With office automation secretaries don't just need word processors. You could argue that they also need telex, access in Prestel and other public databases, a personal computer for specific applications, a computer terminal for batch and interactive processing work, an electronic mail service and teletex," says Winder.

"What we have done is put all these functions on one unit. In other words what we are offering is a multifunction workstation. But it still has word processing as its main use."

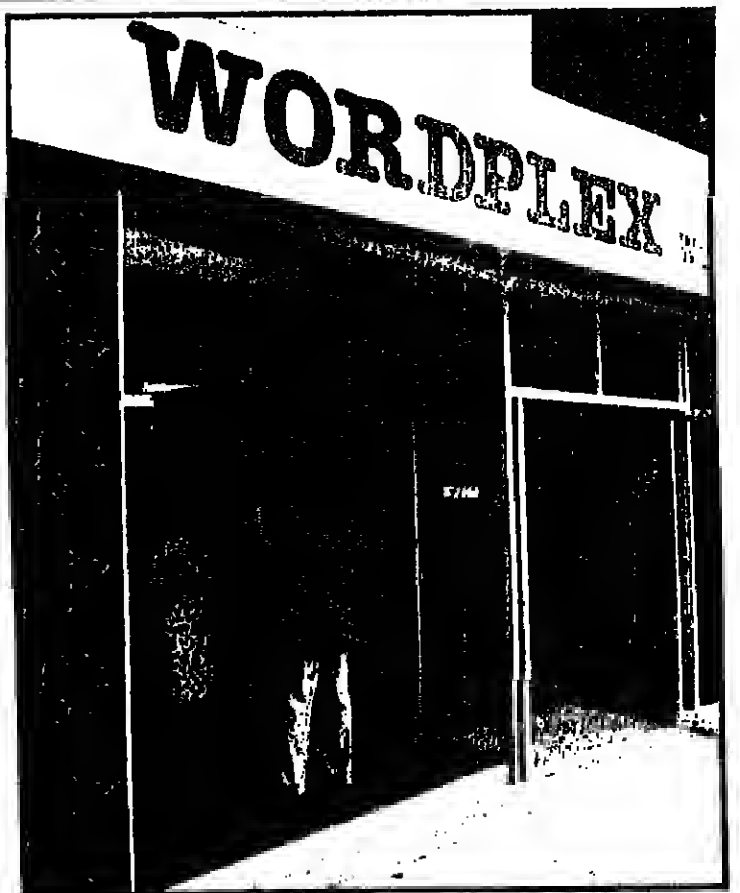
One of the most obvious advantages of multi-functional word processors is that data can be transmitted in different forms.

One of the most obvious advantages of a multifunctional word processor is that data can be transmitted in different forms

example, a letter typed in the usual business format can also be transmitted as a telex. And because the workstation operates as a telex machine, the telex room and equipment can be done away with.

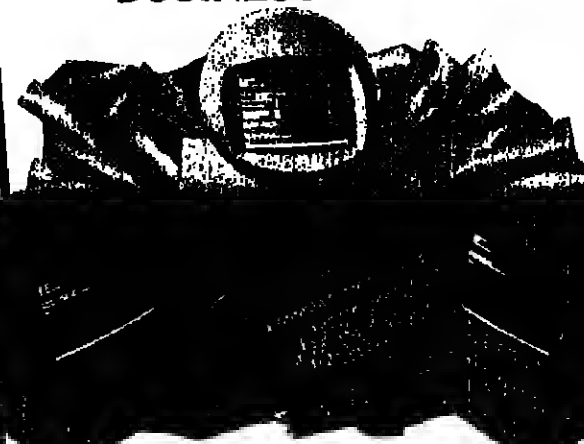
Wordplex has taken this philosophy a stage further with the introduction last October of the Planet local area network, which is made by Racal. "This means that each word processor can have access to storage, but at the same time has the individual capacity to provide word processing, communications and other functions," explains Winder.

Another aspect of the Wordplex philosophy helps users to wear themselves gently off straight typewriters and into office automation age. Multilink is a communications facility which links electronic typewriters to word processors. This means that up to 15 typewriters can be used to feed data into a central word processor where it can be edited



Wordplex believes in dedicated word processing and has franchised 25-30 bureaux to prove it.

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PEOPLE



■ Nigel Banister has become managing director of NAW Computers, and David Fachiri, formerly marketing director, has succeeded Banister as marketing director.

■ Ray Kite has joined Data & Control Equipment of Aylesbury as international marketing executive. He has been a territory sales manager at Case and most recently worked in Dubai with Emirates Telecommunications Corporation.

■ Alex Reid has joined the board of Acorn Computer Group as a non-executive director. Until recently Dr Reid was a director of British Telecom. From 1981 to 1983, he was chief executive of British Telecom Spectrum, which includes BT, electronic mail, radio paging, and radio phone services. Previously he was director of Prestel and director of business systems.

■ Micro-Marketing (Electronics) has appointed John Hewitt as sales and marketing co-ordinator. He joins from Semiconductor Specialists, where he was senior product manager.



■ General DataComm has appointed Joe Lloyd (above) former ICI senior communications expert, as sales and marketing director for the UK. He has also held senior positions with Ferranti, GTE and Rascal Milgo.



■ A new STC company, STC Technology, has been established with Simon Wilder (above) previously with the Plessey company, as managing director. The new company groups Standard Telecommunication Laboratories (STL), STC Ltd (the telecommunications development centre and software systems house) and STC's automation unit and new product development unit. The four elements employ 1,500 people, chiefly engineers and scientists. Dr Wilder has worked for the past 13 years at Plessey, where he was managing director of Plessey Controls, managing director of Plessey Telecommunications Research and, most recently, director of engineering and digital switching.



■ Hugh Parker, a former director of McKinsey and Co, has been appointed a non-executive director of DPCE Holdings, the independent computer maintenance company which went public in July 1983. Parker worked with McKinsey and Co for 32 years, 25 of them in the UK. He founded the company's UK operation, and from 1959 to 1974 was its managing director. He retired as a director of McKinsey and Co in 1983.

■ Brian Carr (left) and Barry Aiken (right) have been appointed directors of Memorex UK. Carr continues to have responsibility for all aspects of customer service and Aiken is responsible for personnel and training. Aiken joined Memorex in 1976 as personnel manager. Carr has been with Memorex for four years. The new directors join John Clarke, managing director, John Lambert, finance director, and Edward Picken as executive directors of Memorex UK.

■ Keith Poole has joined Trident Computer Services as a recruitment consultant. He has 17 years of DI experience including 14 years with ICL.

■ John Smykalis is now marketing executive at Sigmex. He comes from Nippon Electronic Company, where he worked for three years as product marketing manager.

■ Chris Whetherly has been promoted to sales manager within Trident Computer Services. He joined Trident six years ago.

■ Kevin Stigberg joins Peachtree Software International as account manager responsible for the Philips, Digital Equipment Corp and Scan Computers accounts. He has some 15 years' experience in the computer industry having joined Litton Industries as systems analyst in 1968. Previously he was at Geisco for three years.

■ John Farrand has been appointed president of Atari and president and chief operating officer of Atari Products Company. Other Atari Products Company appointments include: Donald Kingborough, executive vice-president of sales; David Ruckert, executive vice-president of marketing; Paul Malloy, executive vice-president of operations/product development; Mirelan E Hoff, executive vice-president of research and product development; and Steve Calfee, vice-president of entertainment software. Charles Paul has been named president of Atari's coin-operated games unit.

■ Paradyne has appointed Sergio Rocco as international sales manager. He comes from Transac-Alcatel, where he was area manager, for the Mediterranean countries.

■ Keith Elliott joins Elan Computers from What Micro? magazine, and Steve Groves joins Mattell where he had responsibilities for after-sales service in Europe, the Middle East and Africa. Elliott takes on the job of commissioning and producing original software for the Elan Enterprise 64 and 128 home computers.

■ Tony Monk has been appointed to the new post of education director by the Circle group. Monk, previously a lecturer with Will-Denn, brings 10 years of CICS/VS experience to his new role, which complements Circle's consultancy and software operations.

■ Masstor Systems International has appointed Martin Fitzgerald as technical development director for Europe. Before joining Masstor he was production manager for SIA Computer Services.

CONFERENCES

■ Roger Whitehead, chief consultant with Office Futures, is to present a revised version of Pergamon Infotech's tutorial "Managing the Automated Office." The new programme for the three-day event, in London from February 21-23 emphasises the importance of existing organisational structures and procedures in planning for the use of automated office systems. Fee is £425 + VAT. Further details from Pergamon Infotech, Maidenhead (STD 0628 International +44 628) 39101.

■ Information Futures is running a two-day tutorial followed by a two-day international conference from February 21-24, at the Cafe

Royal, London. The tutorial will examine the key technical aspects of Unix of concern to experienced computing staff meeting Unix for the first time. It is designed for experienced systems and programming staff who have used other operating systems and who wish to gain a technical insight into Unix. Further information from Diana Pither, Information Futures 07535-58811.

■ Datasolve Education's ANS Colloquium programming workshop takes place at its London Education Centre from February 20 to February 24, and the cost is £790.

■ Access - Your Flexible Friend. D. Ashman, Access, BCS Guildford, Paddock Rooms, Green Man, Burgham, Guildford, 7.00.

■ Computing in the Houses of Parliament. Richard Morgan, BCS London Central, Charing Cross Hotel, London WC2, 6.00 for 6.30.

■ Microelectronics Assisting the Physically Handicapped. Pru Greenwood, Bristol Polytechnic, BCS Oxford, Staff Coffee Lounge, Oxford Polytechnic, 7.45.

■ Computer Modelling of the Economy. Gerald Harbour, University College, Cardiff, BCS South Wales, joint meeting with Spordis, Royal Hotel, Cardiff, 7.00.

■ Ada - Why or Why Not? T. A. D. White, RSRB, BCS West Herts, Aubrey Park Hotel, Redbourn, 8.00.

■ Annual dinner dance. BCS Belfast, Claddon Hotel, Belfast, 8.00 for 8.30.

■ J. (Jan) Robertson has been appointed deputy computer services manager at Guardian Royal Exchange Assurance. He joined GRE's data processing department in 1968 as a systems analyst, and was promoted to manager of GRE's general insurance systems in 1977.

■ John Coghlan has been appointed as sales manager for Fairchild Component Test Systems, based in Ferndown, Dorset. He joined the company in 1980 as an applications engineer, then moved into sales. Previously he was with ICL as an engineer.

■ Mideltron has appointed Derek Holloway as sales engineer with its Systems Division. He is in charge of Mideltron's North of England sales territory.

■ Hewlett-Packard has appointed Roger B. Wilson as director, corporate communications. He previously held positions as manager responsible for international marketing communications at Rank Xerox, and director of marketing communications for Europe, Africa and Middle East Division of Singer.

■ Sord is adding to its UK senior management team with the appointment of Ben Tanaka as director. He is Sord's international sales manager.

■ Tenhill Computer Systems, a West Yorkshire-based software house has strengthened its management team. John Edmondson, a former leasing company director joins as financial director; and Derek Irvine joins with 20 years' computer industry experience as sales and marketing director. Kim Waseley and Martin Straw, long-standing Tenhill employees, have been promoted to programming manager and support manager respectively.

■ A software development house has been established at the Lark UK headquarters of Anker Systems, under recently appointed product development manager Tricia Carter.

■ Baric Computing Services appointed Peter Kerry as sales manager. He joins from where his service included a part of secondment to ICL, Com and a Diamond Club award, the highest award for outstanding achievement.

■ Alan Norman, now with marketing communications department of Nixdorf Computer was previously with Myriad AI Sales, where he co-ordinated marketing for the computer distribution of microcomputer systems throughout Europe.

■ Paul Sandham has joined Management Science America as systems consultant, specialising in accounts payable and purchase order control on UK accounts. Most recently he was systems designer at ICL involved in order processing and accounting packages, and before that with Spence as sales executive in the glass business systems group. Mr Van De Water also joins MSA as systems consultant, responsible for cash management support systems receivable. For the last years he has been at MW Kellogg (chemical engineers).

DIARY

FEBRUARY 16
Fly-by-Wire/Light Flight Control Systems, R. G. Collinson, Marconi Avionics, Institute of Electrical and Electronics Engineers, Kings Arms Hotel, Christchurch, Dorset, 8.00.

FEBRUARY 20
Computers in the Retail Store. W. Anderson, John Smith Bookshops, BCS, Glasgow, Mar Room, Staff Club, University of Strathclyde, Glasgow, 7.00.

FEBRUARY 21
PABX - the Role of the Electronic Office. I. Milne, BCS Merseyside, Dept. of Engineering, Liverpool, 6.00 for 6.30.

FEBRUARY 22
Some Practical Applications of Microcomputers. Dr R. May and W. McClean, Institute of Electrical and Electronics Engineers, Fortisdown, Co. Antrim, 7.30.

FEBRUARY 23
CICS Update. CACI, Systems Training Centre, Hants, £135. Details from Barnes (02514) 22133.

FEBRUARY 24
The Police Computer System. Leicestershire, BCS Leicestershire, Supt. K. Tuckwood, Leicestershire, James West Building, Leicestershire Polytechnic, 6.15.

FEBRUARY 25
Computer Aids for Design. BCS Belfast, Greve Shirley, F. International, Dept. of Computer Science, Queens University, Belfast, 2.30.

FEBRUARY 26
Annual dinner dance. BCS Belfast, Claddon Hotel, Belfast, 8.00 for 8.30.

SMART CARDS

Smart war hots up

The French lead the way but IBM is unlikely to sit back, says Jack Gee

FRANCE'S Bull and Philips Data Systems were the first to bring their smart cards to market almost three years ago. Now the Japanese are touting their own technology and IBM, taken somewhat aback by this onslaught of French technology in its own American backyard, is beginning to take notice.

And in Europe the two main rivals, Bull and Philips, have joined forces. After the race to develop and then manufacture the microprocessor-memory device, the two companies merged it out on the export front. Convinced that the contenders will be stronger if they join forces, the French government put pressure on them to unite.

To consolidate their marketing thrust and to provide work for France's slowly developing microprocessor industry, Louis Mexandeau, the Minister of Posts and Telecommunications, and Laurent Fabius, Minister of Industry and Technology, have nudged Bull and Philips into a shotgun wedding.

Bull, which until a few months ago was losing as much money as IBM-France was making up in profits, has to listen attentively to the French government, its 52% stockholder. Philips Data Systems of France, a subsidiary of the powerful Dutch multinational, was, for a time, less happy about the match.

"What we want Bull and Philips to do," says Alain Turbat, the French Telecommunications Authority's director for its memory card project, "is not to form a single company or marketing unit, but to use the same chips on their cards. We don't want to set up any sort of monopoly. But a single chip system has enormous advantages."

The Bull system of a single chip offers better security because it's cheaper than Philips' twin chip technology, offers better security (it's harder to break into the memory) and performance is also enhanced, according to Turbat. "Although Philips uses separate chips for memory and microprocessor, they really agree with us," the French Telecom director adds.

But at Philips Data Systems, it was difficult for some time to find an enthusiastic echo. "The French government is subsidising its national component industry," says André-Jacques Selezneff, advanced projects manager. "So it's not surprising that they wanted both Bull and ourselves to adopt the same French chip."

That chip, now under development by Thomson's Burotechnique division, will not be ready for shipment in quantity for another couple of years. "It will be more powerful than the smart card chips now in use," says French Telecom's Turbat.

Hervé Nora, French Telecom's whizz-kid who has been masterminding the authority's telecommunications to develop convergence of computer and telecommunications technology, until his recent appointment as managing director of Bull's smart card division, shares the enthusiasm of his old colleague Turbat.

"Together, Bull and Philips can open up the market," says Nora. "If we have the same chip system

we will make ourselves just that bit more credible."

At Intelmatique, the marketing subsidiary of French Telecom, Roy Bright, the British managing director hired away from Prestel four years ago, concurs: "It will certainly make our efforts here to export the smart card more successful with the two companies having their heads together."

Philips felt aggrieved by all this pressure. Advanced projects manager Selezneff says it is natural for the French government to support Bull, since so much taxpayers' money is being pumped into the firm. He also declares that, in spite of this logical preference, the state treated Philips fairly in giving it access to the smart card trials now under way in Blois, Lyons and Caen alongside Bull.

However, it was certainly a disappointment for Philips in January when the joint committee composed of French Telecom and the state-managed banks announced that, following the trials in the provincial centres, the Bull card was being chosen for the principal applications in point of sales terminals, as a bank card and for

We'll have headaches providing the volume to meet demand

the new public telephones on which cardholders' calls will be debited directly to their home or office phone bill.

Selezneff stresses that, in spite of Bull, Philips has been faster in developing its card and getting it into trials on both sides of the Atlantic. "Bull began with an operating card before us," he admits. "But we moved faster. Starting from scratch, we had a prototype ready for the Paris computer show, Sicom, in only three months."

This performance impressed the American Defence Department who invited Philips - but not Bull - to provide 2,000 cards in a search for a new type of identification card which will not be exposed to the same risks - fraud, misuse, theft - as the ID cards now used by the US armed forces.

"We're waiting for a decision from the Pentagon on what happens next," says Selezneff. "We know they liked our system."

But France's lead in this technology could melt away as fast as it has snowballed. "We know that IBM is developing a smart card of its own," says Bull's Nora. "The Japanese are even further ahead. They may be still at the stage we were at back in 1981. But it will take them much less than three years to catch up."

Bull has recently opened a sales office in Dallas, Texas with staff of six who are already ranging the US in search of new orders. Meanwhile, the smart cards are being cranked out of the factories faster and faster. So far, Bull and Philips have produced 100,000.

But this summer, Bull alone will be turning out that quantity every month. "Before, it was a problem of finding uses for the cards," says Hervé Nora. "Now we might have headaches satisfying demand."



Hervé Nora, managing director of Bull's smart card division, with his product.

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Computer Modelling of the Economy. Gerald Harbour, University College, Cardiff, BCS South Wales, joint meeting with Spordis, Royal Hotel, Cardiff, 7.00.

Ada - Why or Why Not? T. A. D. White, RSRB, BCS West Herts, Aubrey Park Hotel, Redbourn, 8.00.

Annual dinner dance. BCS Belfast, Claddon Hotel, Belfast, 8.00 for 8.30.

SOFTWARE MONTH

Distributors have cashed in on 1980s micro boom

Micros and companies with micros have multiplied tenfold since the 1970s. Micro software distributors now abound

JUST as the computer market begins to show signs of maturity, and the new terminology begins to settle down into generally recognised meanings, along comes a new development to disturb matters once again. In this area, the microcomputer is much to blame. It's not that this newer technology is so vastly different from the old in its operational concept, it is simply that the volumes concerned make all the old mainframe rules redundant. For where there used to be one company with one mini- or mainframe computer, there are now 100 companies with a microcomputer; and where a company had one mainframe, it might now also have 100 micros.

The result is a vastly increased market for software from companies that generally understand less about computing than did the buyers of the 1970s, and are not willing to pay anything like the sums required for mainframe and minicomputer software. This, in turn, has led to one of the great boom areas of the early 1980s — the microcomputer software distributor.

Software distribution is a dynamic area — as evidenced by the growing number of distribution companies. Defining who is, and

"UK software has not yet reached a level of user-friendliness high enough for it to be sold unsupported"

who isn't, a true distributor is, however, very difficult. For example, the modern software supplier will often buy new products to complement his own. He will then sell his own packaged programs (which makes him a software supplier) and other companies' packaged programs (which makes him a software distributor-dealer) to dealers (which makes him a distributor) and to end users (which makes him a dealer). One company that almost fits this role is Peachtree Software International, undoubtedly one of the

more dynamic of today's software companies — but one that Peachtree considers itself to be a software developer, and not a software distributor.

Richard Moore, Peachtree's UK general manager, believes that the software market would benefit from a greater number of specialist dealers concentrating expertise on selected applications.

"Some software," he explains, "such as Peachtree or Lotus 1-2-3 can be sold simply as a commodity, and in this area the distributors have an important role."

"More complicated packages

The volume of micros makes all the old mainframe rules redundant

like accountancy ledgers can be more successfully sold as part of a total support package. This is usually done through dealers who have chosen to specialise in supplying total business solutions to users."

This view is similar to that of Mike McDonald of The Bristol Software Factory. "The market in the UK," he claims, "is at an advanced stage of development with a high level of user awareness; that is, users expect and require support in terms of training and queries. The software itself has not yet reached a level of user-friendliness high enough for it to be sold unsupported."

"But the software distributor is merely acting as a middle man and will not be able to afford the technical support effort required. Software without support may be sold through a supermarket, but today's user would generally prefer to have the support of the local dealer."

In theory, we could say that the distributor provides software (and perhaps technical support) to a network of dealers, who in turn provide packaged solutions to the end user. But perhaps the only practical method is to look at the number of packages that the

dealer/distributor provides.

If he specialises in just a few packages then he is perhaps a dealer; if he has no particular specialisation and provides hundreds of different packages, then he is a software distributor. If this test were applied to the companies included in this month's survey, then there are many dealers that consider themselves distributors.

There is a name missing from this month's survey; a name that is almost inseparable from the term software distributor: Lifeboat Associates.

It could almost be said that Lifeboat, one of the giants in US software distribution, started the market in this country — and yet the Americans pulled out of the UK in the latter part of 1983. Does this mean that there is a vulnerability to distribution?

Most remaining distributors think not. For example, Barry Neil, the sales manager for MFI Ltd, gives several avoidable reasons for Lifeboat's UK failure: "... most notably a lack of fast response and a lack of technical support. Lifeboat in the UK was just a freight forwarding office for the US parent company. How can you expect to survive when every time a dealer wants a product it must be ordered specially from the States?"

This view is echoed almost perfectly by Geoff Lynch, the managing director of Xitan: "Lifeboat UK was always independent of Lifeboat USA, and it failed for three reasons: one — Lifeboat UK made little effort to obtain the mainstream dealer business; two — competitive UK distributors had begun to stock software packages and could therefore offer a much better delivery; and three — the UK operational manager left and was not replaced."

"No one would buy from Lifeboat," confirms Mike McDonald of The Bristol Software Factory, "because they couldn't support the

Lifeboat was scuttled before it had a chance to sink of its own accord

products that they were selling. And anyway, the same packages were available from UK representatives of the originating software house at better prices."

Peter Hewitt, the marketing manager for Britain's world-acclaimed software house Micro Focus, put the failure down to a lack of commitment from Lifeboat. "The key reason for having distributors in the software market," he explains, "is that they have the ability to cope with different machines and disc formats. Although Lifeboat had these facilities in the US they did not have that ability in this country, and that is why they failed. Other companies that have gone to the trouble to make this investment are more successful."

But we should not be surprised by the disappearance of Lifeboat — importers rarely manage to stay at the forefront of their particular science. Dominic Dunlop, the technical manager of Unix specialist distributor Sphinx, sums



it up thus: "In the late 1970s, Lifeboat, entering what was then virgin territory, had the chance to sweep the board."

"Sadly, while its prices were attractive, its support (or lack of it) and down market image were not. What's more, its catalogue of packages in its catalogue, few would have passed the kind of rigorous quality check that is required to ensure that software sold without support really works, and really can be used by anyone who buys it."

"As so often happens, later entrants in the field look set to overtake the trail-blazers by recognising these mistakes and not making them again (where now is



MOORE: "Some software can be sold simply as a commodity."

SOFTWARE MONTH

The industry is changing and a battle is on for lower margins which some distributors see as unmitigated disaster

Opinion is divided on the price-cut battle

IF one of Lifeboat's failings was to offer mainstream dealers sufficient margins, it begs the question that we are perhaps beginning to see the start of a software price war.

Since it is already happening in the hardware market, is it likely to repeat itself in the packaged software market? Many users look at the physical cost of a package (one disc, say £5), then look at the supplied cost (up to £1,000 plus) and feel that software is overpriced.

One thing is certain: the software market is changing, and will change even more rapidly during the next few years.

Even as this feature goes to press, a group of the major distributors are beginning to edge closer together. Does this mean the beginning of a Dallas oil-like software cartel?

Opinions on price wars are divided. "No," says Barry Neil of

the number of distributors around at present.

"The problem is not getting business, but getting qualified staff. I would see a head-hunting war as much likelier."

But Ronald Young, managing director of Systematics International, has no such doubts. "We are seeing a software price war now," he claims. "The trend was set by Sir Clive Sinclair when he launched his new QL Microcomputer last month. Included in the price of £399 are four very powerful software products."

"Clearly, both Sinclair and Psion, the software house, are looking for low price high volume."

"It is quite likely that other software houses and manufacturers will have to consider either reducing their prices and bundling with the hardware to compete with Sinclair, or await the outcome of the Sinclair venture."

"Sinclair is primarily selling at this price by direct mail order, and we may well see software houses changing their emphasis more so to direct mail order in order to compete."

Lynch sees a price war coming from a different area: "At the distribution level it is already happening. An interesting phenomenon," he believes, "is the distribution of margin between the dealer and the distributor."

Typically, a distributor who gets 60% discount of the RRP (before production, import and duty costs) will be providing that product at 40% discount to the dealer. If one accepts the assumption that the 'hidden' costs are at least 5%, this means that the gross margins are 40% for the dealer, and 25% for the distributor.

"Recent moves have been seen to change this to 45% and 18.1% respectively — which is very unhealthy as it leads to the dealers giving away their margins. The main reasons for this are, firstly, a portion of the market is disappearing as hardware suppliers begin to take on software distribution (for example, Sanyo and ACT); secondly, there is an increasing number of other new entrants into the market (it would appear, for example, as if W. H. Smith now has ambitions in this direction); thirdly, another portion of the market is disappearing as software publishers, such as Ashton-Tate, start to sell direct; and finally, there is an increasing degree of competition and failures among

"Software is a totally man-time related product, and man-time costs have never decreased. The only opportunity for software price cutting will apply to ageing products (like, say, WordStar) where volume sales have already been obtained, the product is stable, well-supported and well-known, and both developer and software OEM have recouped the original investment and made a profit."

"The present profit margin for distributors," confirms Neil, "is too slim to make a price-war anything but an unmitigated disaster area. Besides, the European micro software market is expanding fast enough to support several times

the dealer themselves."

Chris Base, national dealer manager of Midtron Distribution, believes that discounting exists, but says it is unhealthy to the industry. "The major problem in the market at the moment is dealers' and retailers' discounting products — the result of which is becoming only too apparent in the bankruptcy court."

"I feel that the recommended retail prices will remain about the same, and the discounts will gradually be forced out of the business — leaving the computer market to the more responsible companies."

"Support and stocks must be paid for. Without them the end user gets a cheap product, but one

with so little support that it may be useless."

This is a view supported by Chris Towers, joint managing director of Selven Systems, a

"The only opportunity for software price cutting will apply to ageing products where volume sales have already been obtained"

systems house specialising in CP/M-based commercial software and local area network hardware.

"Any software price war," he claims, "would only be a short-term expedient by distributors who are discounting their services to make a quick buck."

Towers sees the solution to the overall problem in educating the end user in understanding the true value of a standard software package. "At present," he claims, "some of them fail to understand why even minor modifications can cost as much if not more than the original cost of the package itself."

"Pre-sales support is another hidden cost."

"Furthermore, discounting every part of a system is ruining the market for the genuine systems house who is providing a high standard of support."



McDONALD: "... Man-time costs have never decreased."

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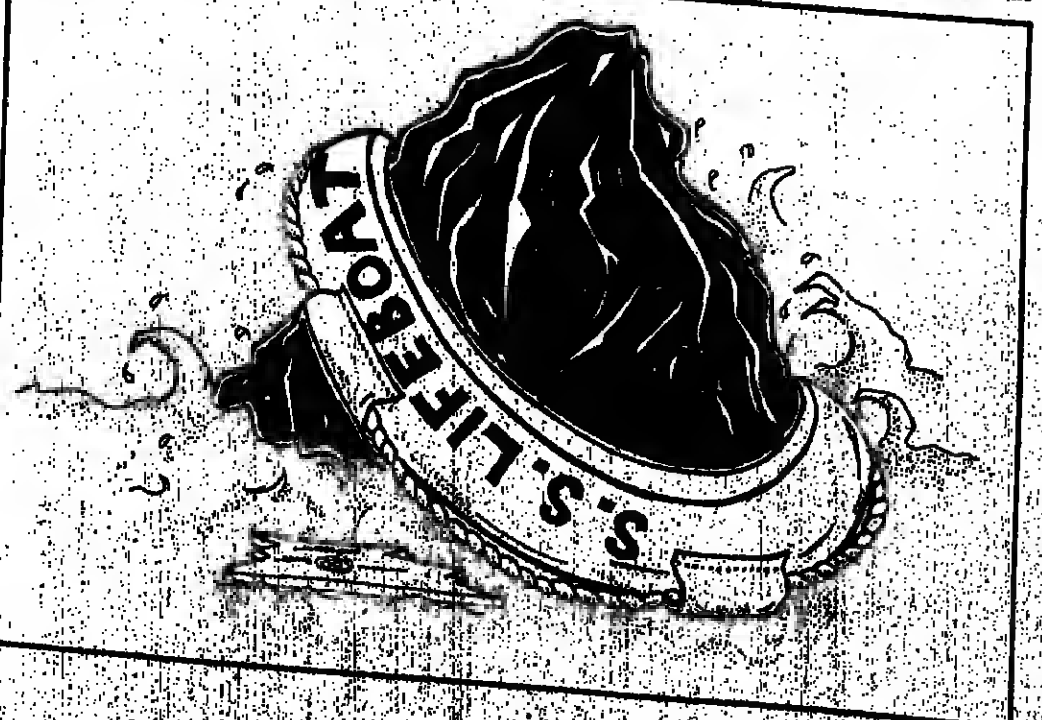
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A dBASE II User Group has been formed. For further details contact User Group Secretariat Caroline Tanner on 0908 568866.



"How about a nice bit of software, guv'nor?"

DUNLOP ... "Lifeboat had the choice."



SOFTWARE MONTH

Our survey shows software distribution really means microcomputer software

Micros open up specialised market

SOFTWARE distributors are a recent phenomenon spawned by the rapid growth and dissemination of the microcomputer. So dynamic is this market (distributors come and go almost with the regularity of the high street newsagent's computer magazine) that it is worth reflecting on what the future might hold.

Some distributors (like Geoff Lynch of Xitan) feel that there are already too many distributors; others (like Barry Neil of MPI) feel that the market can support still more. But there is one characteristic of (almost) all the companies that took part in our survey of software distributors: software

required for the up-market hardware.

Even as it is, he continues: "I would like a hot dinner for every overseas user technical query I've received because the local dealer doesn't know, doesn't care, or can't be found."

John O'Connell is managing director of Corporate Modelling Consultants, the company that develops, markets and supports the popular IMA financial modelling package. His view is particularly relevant since IMA is available on miniframes, minis and microcomputers.

A market for mainframe distributors? "I don't think so," he comments. "It's the volume market that attracts distributors, and there promises to be no explosive growth in the mainframe market sector in the foreseeable future."

Another factor worth noting, he continues, "is the larger proportion of expert buyers in this market segment, and the longer decision cycle they involve" — none of which is attractive to the software distributor.

On a similar theme (the mass market), Dominic Dunlop, technical manager of Sphinx — specialist distributor of Unix — strikes a more optimistic note. "Mainframes, although a small market in themselves, can now run the Unix operating system popular on minicomputers and super-micros, making it easy for the distributor to offer the same package across a wider range of hardware — itself a particularly attractive proposition for the larger company with a wide existing range of hardware."

"What is often overlooked, however, is the need for communications software to unite such disparate systems. The traditional computer suppliers have solutions only for their own products — but the software distributor will in-

creasingly fill the gap by making modern networks of existing mixed-vendor hardware."

But, as perhaps the exception to prove the rule, Allied Aims is an existing large systems software distributor about to enter the software jungle. Says Mike Connolly, sales and marketing director: "It is debatable whether we should really call ourselves a software producer or software broker."

Allied Aims is effectively the commercial arm of the Allied Breweries Management Services Company.

The company has identified a number of software packages which it is either evaluating or about to market.

"Our philosophy as a selling company," explains Connolly, "will be to sell only the software

"The mini and mainframe market can support software distributors — but only those acting as super dealers"

that we have tried and tested ourselves.

The confusion between the terms "producer" and "broker" arises because Allied Aims will market both its own and third party software. "We are developing," he explains, "a minicomputer vehicle fleet package which can also be networked to remote locations from a central point. We took our ideas to the NCC and were subsequently given a sizeable grant through the Software Products Scheme."

One of Allied's third party products about to be adopted is "a relational database come artificial intelligence package, primarily aimed at mini and micro users to create applications quickly by the end user."

Research suggests a productivity improvement of between 300% and 500%, says Connolly.

A positive view comes from Ron Young, chairman of Systematics International. "Many people," he claims, "believe that the micro has killed off the mini and mainframe

since it can offer the same power at a fraction of the cost. What they forget is that the cost of the hardware is not that critical."

Finally, we cannot ignore the precise views of Barry Neil. "The mini and mainframe market," he claims, "can support software distributors — but only those acting as super dealers. Companies that will act as distributors in this market will include those like Seicon, CAP and Logica: that is, the large systems houses."

There will be no room for the small software dealer acting as agent for such companies because of the long delay between initial interest and final purchase of large systems. Cash flow then becomes a major problem. It is only the larger companies that will be able to take the necessary long-term view."

It would seem, then, that there may be a limited market for large systems distribution, but mainly at the minicomputer rather than mainframe section of the market. In the meantime, it is the micro software market that provides the excitement, and it is worth asking where this is leading.

"Distribution," points out Chris Bass, Middletron's national dealer manager, "is a feature of the European market and does not occur in the US. However, US dealers tend to be very large and carry out many of the distribution functions (such as holding large stocks)."

"The average UK dealer cannot afford to hold large stocks and relies on the distributor to do so for him. His own concern is for instant delivery."

Young sees an impact being made by the new high-powered low-priced home market. He feels that today's distributor will be forced to examine the methods of organisations like Micronet 800 which distribute software via the telephone network direct to the computer.

Derek Budge, managing director of Metacomco, sees a great opportunity evolving throughout 1984 — and is ready to seize it. "The year 1984," he explains, "will see a major move in the direction of machines based on the Motorola 68000 family of microprocessors."

"Both Sinclair, with the new QL, and Apple, with the delayed Macintosh, will ensure an entirely new prominence to what has so far

"The distributor will continue to act as the perfect marketing vehicle for the small software author who hasn't the resources to market his own product"

Digital Research and Microsoft have tended to dominate the systems software market in the eight-bit and IBM-PC dominated 16-bit market (although Micro Focus has managed to keep the

flag flying a bit). But the 16/32-bit market all intents and purposes is ignored for the richer pickings where, "the smaller size enquiries now have as an opportunity to attack this because, unlike their large counterparts, they can be quick in response to new enquiries."

So long as there is a free software market, there will be dynamic distribution market.

But there is one problem for serious distributors must first overcome: the increasing support and problems concerned with after-sales support. MPI's sees it as primarily a dealer's problem.

"Any product which is sold dealer should be supported by dealer. That is the best for dealer discount structure. It's fundamental problems with products should be reflected in distributor. If this chain of support is not properly supported, the distributor will have increasing support problems — the dealer will lose his discounts — and his customers."

Secretly, however, many distributors and dealers claim that day's end-user is not unreasonable. The problem is the microcomputer has more computing capacity than the main of the computer system placed in the hands of the user. This leads to the syndrome called the "user expectations" — the user expects to pack the system, plug it in, and use it without any further ado.

Paul Rayner, the managing director of Great Northern Computer Services, tries to rephrase the situation. "Not every user needs after-sales support. They don't need it, they don't have to pay for it. But on the other hand, many people want and expect considerable after-sales support. Few people would expect to be the time of their solicitation charge."

"The time of a good dealer distributor is just as valuable as should be paid the same way. The good dealer/distributor therefore is going up to provide the support — but the customer should expect to pay for it."

YOUNG... "Cost of the hardware is not that critical."

been a somewhat specialised market. In addition to these specialists, it should not be forgotten that many of the major hardware manufacturers have at least a toe in this market, including IBM, Hewlett-Packard, Tandy and Mitachi. "This commitment to 16/32-bit processors will bring many opportunities in British software companies. In the past, companies like

flag flying a bit). But the 16/32-bit market all intents and purposes is ignored for the richer pickings where, "the smaller size enquiries now have as an opportunity to attack this because, unlike their large counterparts, they can be quick in response to new enquiries."

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"The time of a good dealer distributor is just as valuable as should be paid the same way. The good dealer/distributor therefore is going up to provide the support — but the customer should expect to pay for it."

SOFTWARE MONTH

Where to find distributors

Software Month looks at 18 companies in a special survey of those who call themselves distributors

ONE of the main problems for any survey of software distributors is simply knowing where to start and where to stop. What, for example, is the difference between a dealer and a distributor? And what about software publishers, like Caxton and Dataview — should they be included? In the end we decided not to differentiate at all. We allowed the software supplier to decide for himself.

This approach has led to some obvious anomalies. Caxton decided that it should be included; Dataview decided that the survey title excluded it — which doesn't, of course, mean that there is necessarily much difference between the services of the two companies.

The Bristol Software Factory is another anomaly, for it supplies (at the moment, at least) only one product. If this were the traditional old mainframe market, it would simply be called a software house. But that's the joy and the frustration of the micro market: it has turned many of the old ideas and perceptions upside down!

In fact one could agree with Geoff Lynch, managing director of Xitan Ltd: "There are between five and 12 'independent' distributors. — ACT Pulsar; Encotel; Middletron; MPI; Pete & Pam; Soft Option; Softel; Software Ltd; Tamays; Telesystems; Trade-soft; Xitan."

"Our feeling is that this is probably about five too many!"

Allied Aims Ltd
107 Station St
Burton-on-Trent
Staffs DE14 1BZ
Tel: 0283 45320
Contact: M. D. Connolly
No of packs: 6
Best seller: Vehicle fleet cost control
Hardware: IBM, 308X, S34136,
PC, CA, SYRA
Software: no specialisation
Established 1981
Turnover: £10,000,000

Caxton Software Ltd
10-14 Bedford Street
London
WC2R 9HE
01-379 6502 Telex: 27950 ref 398
No of packs: 4
Contact: Bob Huckle
Best seller: Cordbox
Hardware: CP/M and MS-DOS
Software: Productivity aids
Established 1981

Criterion Computers Ltd
12 George St
St Yarmouth NR31 1HR
0493 3160
Telex: 97329
No of packs: 30
Contact: G. Corser
Best seller: Plant and Tool Hire
Hardware: All CP/M and MS-DOS
Established 1979

Financial and Corporate Modelling Consultants Ltd
46 Chagford Street
London
NW1 6BB
Tel: 01-262 1021
Telex: 838111
Contact: J. A. O'Connell
No of packs: 6
Best seller: Finar
Hardware: no specialisation

Software Distributors
Price list
Computer Weekly
Car

Software: Finar
Established: 1980
Turnover: £650,000

Great Northern Computer Services Ltd
16 Town Street
Horsforth
Leeds
LS18 4RJ
Tel: 0532 589980
Telex: 557061
Contact: Paul Rayner
No of packs: 10
Hardware: CP/M, CP/M-86, MS-DOS
Software: no specialisation
Established: 1979

Metacomco
115 Glenfome Rd
St Werburghs
Bristol BS2 9UY
Tel: 0272 550756
Telex: 44220
No of packs: 5
Contact: Derek Budge
Best seller: Cambridge Lisp 68000
Hardware: 68000 based
Software: Languages
Established: 1981
Turnover: £425,000

Microcomputer Products International
Central House
Cambridge Road
Barking, Essex IG11 8NT
Tel: 01-591 6511
Telex: 892395
Contact: Barry Neil
No of packs: 150
Best seller: BSTAM
Hardware: CP/M, CP/M-86, MS-DOS, PC-DOS-based micros
Software: no specialisation
Established: 1975
Turnover: £1,000,000

Midlectron Ltd
Nottingham Rd
Belper, Derbyshire
Tel: 077382 6811
Telex: 377879
Contact: C. Rose
No of packs: 200
Best seller: Wordstar
Hardware: HP, Corona, Morrow
Software: MicroPro, Ashton Tate, Digital Research
Established: 1972
Turnover: £12,000,000

Pete and Pam Computers
New Hall Hey Road
Rawtenstall
Rossendale, Lancs BB4 6JC
Tel: 0706 212321
Telex: 635740
Contact: David Emerson
No of packs: 2,500
Best seller: Multimate word processor (for the IBM PC)
Hardware: IBM PC, Apple, and printers in general
Software: All IBM and Apple compatible software
Established: 1980
Turnover: £12,000,000

Redwood
2 High Street
St Albans
Herts
Tel: 0727 38138
Contact: Tony Heywood
No of packs: 6
Best seller: Currently Uniplex word processing

Sphinx Ltd
43-53 Maarbridge Road
Maldenhead
Berkshire
Tel: 0628 75343
Telex: 849842
Contact: Phil Martin
No of packs: 30
Best seller: XED word processor
Hardware: no specialisation
Software: Unix-based
Established: 1983

Sosoft Ltd
300 Ashley Road
Parkstone
Poole, Dorset
Tel: 0202 735656
Contact: Neil Hewitt
No of packs: 8
Best seller: Tomorrow's office
Hardware: MS-DOS Computers
Software: Application generators
Established: 1977
Turnover: £250,000

Systematics International Microsystems
Cleeve House
Hamlet Road
Haverhill, Suffolk CB9 8EE
Tel: 0440 61121
Telex: 99431
Contact: Lesley Logden
No of packs: 10
Best seller: The Accounting Suite
Hardware: All leading stock microcomputers
Software: Accounts, stock control, and office admin

The Bristol Software Factory
Thornton House
Richmond Hill
Clifton, Bristol BS8 1AT
Tel: 0272 735022
Telex: 449477
Contact: Mike McDonald
No of packs: 1
Best seller: Silicon Office
Hardware: IBM, Digital, Sinus
Software: Silicon Office
Established: 1978
Turnover: £2,000,000

Trinity Resource Ltd
Painters Hall
9 Little Trinity Lane
London EC4V 2AD
Tel: 01-248 9212
Contact: Steve Rubin
No of packs: 12
Best seller: Holland Automation
Hardware: JCL personal computer
Software: Database
Established: 1983

Triumph Adler (UK) Ltd
27 Goswell Road
London EC1
Tel: 01-250 1717
Telex: 897772
Contact: Ben Vaske
No of packs: 8
Best seller: Alpha Text word processor
Hardware: Micros and minis by Triumph Adler
Software: All business applications and vertical markets
Established: 1973

Xitan Ltd
Xitan House
27 Salisbury Road
Totton, Southampton SO3 4HX
Tel: 0703 871211
Telex: 477929
Contact: Roger Harris
No of packs: 250
Best seller: dBaseII and WordStar
Hardware: no specialisation
Software: no specialisation
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TRADE FIGURES

The trade gap widens as UK export hopes are dashed

1983 was a black year for UK computer trade, with the total imbalance reaching a record figure. John Aczel reports

BRITAIN's trade deficit for computer systems has grown markedly in recent months, and the total imbalance is estimated to have reached a record figure for 1983. The latest trade figures are for September and show a gap between exports and imports for complete systems of £11.4 million in that month. For the first nine months of the year, the deficit was massive, amounting to £97 million in this field.

For central processing units (CPUs) the imbalance was even higher - £16.5 million in September, compared with £11.4 million three months earlier, while the cumulative figure has been much higher than predicted: £116 million between January and September.

To some extent, it was expected that these sectors would show a big deficit resulting from the buoyancy of the British market for computers. Imports have taken advantage of this high level of demand, but exports have not performed as well as expected.

	September 1983	June 1983	January-September 1983
	£000	£000	£000
Exports of complete systems			
France	421	889	5,153
West Germany	957	1,390	6,136
Italy	147	247	1,587
Japan	306	140	1,307
US	150	93	1,646
Exports of processing units			
Australia	468	204	2,046
Belgium			
Luxembourg	1,897	1,649	16,718
Denmark	672	900	5,113
France	4,808	4,767	39,701
West Germany	6,987	6,529	58,941
Ireland	308	515	5,529
Italy	3,371	2,278	21,823
Netherlands	2,803	3,296	22,441
Norway	813	424	4,606
South Africa	903	1,006	6,711
Spain	1,991	1,676	10,203
Sweden	1,610	1,007	15,697
Switzerland	1,757	2,089	10,787
US	859	1,722	8,173
USSR	523	—	2,705

Table 1 - British exports of computer systems - by value

	September 1983	June 1983	January-September 1983
	No.	No.	No.
Exports of complete systems			
France	306	267	2,934
West Germany	5,199	482	7,233
Italy	42	411	1,060
Japan	23	20	154
US	39	29	560
Exports of processing units			
Australia	4,849	208	5,839
Belgium			
Luxembourg	1,381	2,960	16,660
Denmark	442	1,399	6,307
France	1,993	1,895	35,045
West Germany	15,245	2,616	79,947
Ireland	344	100	1,451
Italy	1,227	893	15,593
Netherlands	1,016	1,415	22,887
Norway	360	413	6,603
South Africa	1,880	630	7,312
Spain	7,050	1,409	16,902
Sweden	427	137	16,924
Switzerland	272	617	6,100
US	1,088	104	2,510
USSR	3	—	95

Table 2 - British exports of computer systems - by volume

Overall imports have remained high, despite the recent fall of sterling against other currencies. Foreign suppliers have been willing to reduce their prices in sterling terms, even if this has meant lower margins for their products, and competition has been quite fierce among most imports.

Total imports of CPUs reached a record figure of £51 million in September, representing an increase of 13% compared with three months ago. For the first nine months of 1983 the total amounted to over £380 million, which was considerably higher than in previous years.

In terms of volume, the increase in foreign deliveries has been even more pronounced. Over 110,000 CPUs entered the UK in September, which was about double the figure reported three months earlier. And the cumulative figure has gone up markedly, reaching 420,000 units.

Price-cutting has been widespread, and the average price of a processing unit dropped to about £450. This was considerably lower than at the beginning of the year, and further falls are expected in this field over the coming months.

Imports of processing units have come from a wide range of sources and a significant increase has been reported from Japan. Its sales amounted to £4.8 million, which was tenfold increase compared to three months earlier.

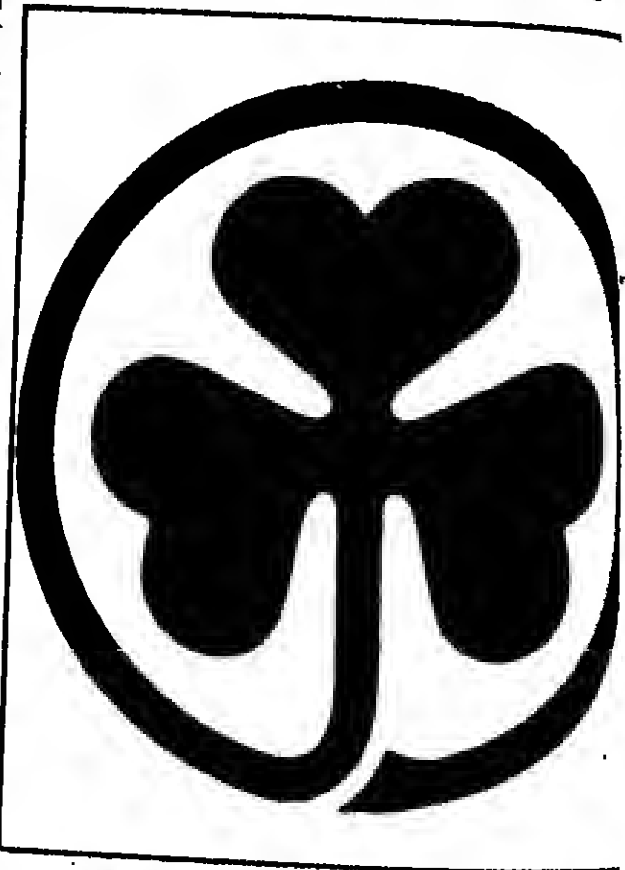
Deliveries from Ireland have also been higher and rose by 55% to £14 million. In contrast, sales from other European countries have been lower, particularly from France. Sales by West German suppliers have also gone down and amounted to only £4.3 million, as against over £8 million in June.

The US continued to be the main supplier of processing units, but its deliveries have been under some pressure. Thus, they fell by about 15% to £15 million in September, while, by volume, the number of CPUs exported by the US declined even more.

In the case of complete systems, the trend in imports has been mixed and a slightly downward trend has been experienced in this period. Foreign deliveries of complete systems amounted to £14.5 million in September, against £16.4 million in June. The total for the first nine months, however, was well maintained: over £120 million between January and September.

It appears that there has been a trend towards importing processing units without input-output attachments in recent months. This may partly explain the fall in deliveries of complete systems, though this trend has varied considerably over the short-term.

For imports of complete systems, higher deliveries have



Deliveries of processing units from Ireland have also been higher and rose by 55% to £14 million

been recorded from Ireland, with its sales rising by over 60% to £13.3 million in September from that source. Sales by the US, however, have been lower and dropped to £3.5 million, while a similar trend was also seen with regard to West Germany and Italy.

British exports of computers have shown an uncertain trend, and overall sales abroad were level pegging in value terms over the past few months.

UK exports of processing units amounted to £34.7 million in September, compared with £34 million three months earlier. In addition, the total for the first nine months was somewhat lower than expected: £267 million in this sector.

In terms of volume, there has been a useful increase in sales abroad, with exports of CPUs reaching over 40,000 units in September; this was about double the June figure, but most of the rise was due to higher exports of smaller types of equipment, particularly at the cheaper end of the micro market.

As a result, the average price of British exports for CPUs has been dropping and declined to only £830 per unit. This price was down by about 20% compared with the average at the beginning of 1983.

In Europe, British exports of

CPUs have been performing well, and sales to West Germany advanced by 8% to £7 million in September.

In contrast, deliveries to the US have been under pressure and dropped by nearly 50% to less than £860,000.

In the case of complete systems British exports have been down £3.1 million in September, against £3.7 million in June. The cumulative total has also been disappointing, amounting to £25.6 million in this field.

The main reason for this fall has been lower deliveries to West Germany, where sales dropped 1.3% to less than £1 million.

The outlook for exports remains cloudy at the moment, though the potential for higher deliveries of microsystems is promising. Competition for complete systems and CPUs is hotting up but some British manufacturers do not seem to be taking advantage of the fall in sterling to improve their sales abroad.

For imports, however, a sharp significant growth in deliveries is expected, especially from Japan. Some of the European countries are now stepping up their sales to the UK and this will mean the British trade deficit for CPUs and complete systems will increase even further in the coming months.

	September 1983	June 1983	January-September 1983
	£000	£000	£000
Imports of complete systems			
West Germany	4,263	5,251	32,012
Ireland	3,301	2,022	26,256
Italy	1,200	1,844	8,715
Japan	529	715	4,661
Netherlands	3,491	4,671	34,183
Imports of processing units			
Belgium	223	400	3,422
Denmark	3,923	45	2,106
France	4,301	4,274	42,991
West Germany	14,297	5,017	47,245
Ireland	1,183	1,575	9,157
Italy	4,835	546	11,666
Netherlands	17,782	1,664	18,666
US	15,046	17,548	142,652

Table 3 - British imports of computer systems - by value

	September 1983	June 1983	January-September 1983
	No.	No.	No.
Imports of complete systems			
West Germany	713	3,335	17,645
Ireland	6,990	396	15,487
Italy	79	713	3,163
Japan	647	6,374	31,363
Netherlands	1,902	403	5,163
US	1,603	1,748	11,405
Imports of processing units			
Belgium	190	29	2,801
Luxembourg	32	11	1,379
Denmark	125	66	1,304
France	15,227	25,668	130,294
West Germany	4,440	4,568	36,794
Ireland	483	368	5,301
Italy	98,612	2,154	71,124
Japan	1,503	1,312	10,408
Netherlands	9,354	16,416	101,463

Table 4 - British imports of computer systems - by volume

EXPERT SYSTEMS

Mentor leads the way

It's not only academics who are waking up to expert systems. Nicholas Benwell plots the commercial rise

IF the British Computer Society forms a specialist group in a computer topic, then it is surely fair to claim that there must be an academic interest in that topic. If in the same month the BCS holds a two-day management tutorial in that computing topic, and Logica offers a salary of up to £20K for people with experience in that subject, then there must be academic and commercial interest in it.

Expert systems is the name given to the new development. Expert systems work things out in much the same way as the reasoning in the above paragraph - they actually imitate the way people solve problems.

For many years, well-respected universities like Edinburgh and Stanford plugged away at artificial intelligence, widely regarded as the precursor to expert systems.

It is fair to say that this work aroused only minimal interest in Mammon until commercial systems such as Logica's Mentor were announced.

Mentor is an expert system kernel that is linked to Rapport, a relational database management system. As a result, it can access a large database in the course of its deductions, so providing a general purpose prototype that will give working demonstrations of part of a proposed expert system.

Mentor is rule-based, that is to say, the system follows a set of rules of the form "if conditions the action". In order for it to manipulate facts with a view to reaching a goal or conclusion.

At the BCS tutorial, attended by over 70 people and chaired by no less a guru than Alex D'Agapeyeff, enthusiasm for the new faith was overwhelming.

"Not since the Russian Sputnik started the space race has anything had a similar effect on shaking the US into a major technology programme," claimed Bob Muller, who is a committee member of the BCS's specialist group. And US-UK computing links are closer than in almost any other trade.

The UK researchers, as usual, were one of the first on the scene with their artificial intelligence work, but the Lightbulb Report of 1972, sourced that SRC funding was speedily run down and those who could, emigrated where they knew funding was to continue. Now expert systems are big business and most of the products are American or Japanese.

One organisation fully committed to expert systems is DEC. It has prototype working in the fields of long range planning and scheduling production as well as various financial systems. It chooses which field to adopt by applying a set of criteria that includes: is the knowledge involved largely empirical? Are heuristics applied? Are people good at solving this sort of problem? Is it a topic where less than 100% success is acceptable?

Much of its work relates to subjects that cannot be solved algorithmically, and as that is the way that nearly all the world's systems operate at the moment, this leaves the way open to people like DEC to re-design its products accordingly.

D'Agapeyeff, in his introduction to the BCS meeting, referred to a DEC vice president who could get a modification to an expert system installed more or less overnight whereas a comparable Cobol program would require a month or two.

Bruce MacDonald from DEC suggested in another paper that this view was a little optimistic. Major changes, or indeed mere modifications, could be readily achieved, although a bigish change to one of its systems, with some 4,000 rules, had taken nearly three months.

Nowadays, DEC feels confident enough to tackle several new such projects and MacDonald quoted the genesis of XSITE, an expert site planning system, with planned overheads of about four people working within a budget of £250,000 per year that will yield annual benefits for exceeding that outlay, if existing expert systems are anything to go by.

Site-planning is a topic where less than 100% success is inevitable and where the knowledge base is certain to be empirical, so it matches at least two of those criteria.

All DEC's expert systems resources are currently based in America but MacDonald is planning to introduce them to DEC Europe.

running, each with between 100 and 200 rules.

One of the examples involved the interpretation of infra-red detector spectra - surely an expert's subject if ever there was one - which works using a pattern-matching technique.

It has cost the company over £40,000 so far but Moralee, like MacDonald, announced that this system had paid for itself many times over in its first year. One wonders why there is not a bigger response to expert systems from the UK data processing industry if they are so readily cost-effective? Nicholas Benwell is a lecturer at Cranfield Institute of Technology.



d'AGAPEYEFF... Shores enthusiasm for the new faith.

Not since the Russian Sputnik has anything had such an effect in shaking up US technology

SPL International is another software house deeply involved with expert systems and, at the BCS seminar, demonstrated Sage online from its offices at Abingdon. Sage has been sold to over 30 UK customers, ranging from the Ministry of Defence to ICI, for around £8,000 a time.

The demonstration consisted of a very simple model based on diagnosing a common disease from some simple symptoms. Five diseases were known to the system and, using some hypochondrics from the audience, they showed convincingly how the expert system chooses between symptoms and grades of symptom.

To judge whether expert systems are really modified SPL attempted to add a sixth disease, scarlet fever, and its slightly different symptoms. Apart from some trivial problems with the editor, the company convinced a group of sceptics that using procedures akin to a BDM enquiry language, it could install a substantial amendment like that in a matter of minutes. Further, those changes depended more on expert medical knowledge than on an expert computer freak's talents.

Max Bramer, from the Open University, summed up expert systems in his paper. He wrote: "A typical system will comprise a knowledge base of rules of the general form 'if X and Y and Z, then deduce A, with probability', together with a control module, called the inference engine, which manipulates these rules to perform inferences, make diagnoses, etc.

"The knowledge base varies from one domain to another, whereas the inference engine is (largely) domain-independent. Thus a system's rule-knowledge can be regarded as data manipulated by its inference engine."

Expert systems are being used in the UK in disciplines other than medicine; we heard of their use in the metallurgy of pipework in chemical plants, and in Unilever's industrial research laboratories. Stuart Moralee, of Unilever, told us that the company has six separate expert systems up and



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PROTOTYPING

How prototyping is making system design user-friendly

In the US users are being presented with system prototypes for evaluation. Guy Thompson reports

WHAT is prototyping? Another buzzword? A systems development method for the future? Or a step backwards to the old days of back to an envelope system design?

The prototyping method of systems development is a current US favourite, where its user friendliness and its speed at implementing systems has converted many.

It is a method that was conceived in the US in 1977 as a reaction against the development methods then in use. These can perhaps be described as sequential in which a feasibility study is prepared, then, if feasible, a general design describing functions broadly in user terms, next based on that a technical design is prepared which leads to programming, testing, acceptance and finally implementation.

At each stage (in theory) agreements are reached, with amendments if necessary before going on to the next stage.

This approach, normally li-

the prototyping method, however, are the speed of development, and the high level of user involvement.

The fast development time is achieved mainly for two reasons: by use of modern software aids, application generators, report and screen formatters, high level languages etc; and by the elimination of time consuming corrections during the final stages of development.

The high level of user involvement comes because after each prototype is delivered to the users, the results of their evaluation (arrived at by a period of using the prototype) are incorporated into the next prototype.

So what are the stages of a prototyping development? Three fairly distinct phases have been identified.

Phase I, Analysis: This includes first the preliminary or feasibility study, and then (if feasible), an information analysis study to determine the functions and to analyse the data flows within the system.

One of the major activities in this phase is to eliminate these. This is usually achieved by an analysis of the operationally problematic elements with trials using full data loadings to isolate the problem areas, although these have often already been guessed at during Phase II.

That is the theory, insofar as a theory has yet been established, but how does it work out in practice?

Here are some observations made during the course of a typical application of the prototyping method. The development was of a mixed operational and informational system, based on a relational database containing 40 megabytes of data.

About 20 transaction screens were involved, all the transactions were online with some batch reporting and a fairly low level of end-user generated (online) inquiries. The elapsed time for development was about nine months and involved about three man years of effort. The hardware was DEC Vax using the Oracle relational DBMS software with its associated development aids including UFI, SQL, IAG and RPT.

From the system and database designer point of view it was comforting to be able to test out some of the basic structures and design concepts without having to be committed at an early stage.

With the iterative approach all sorts of problems and faults that were discovered could be allowed for in the next iteration.

The worries surrounding user acceptance of the system were absent since in a sense the system was designed by the users and after each evaluation, given that the observed faults had been corrected, the system was accepted.

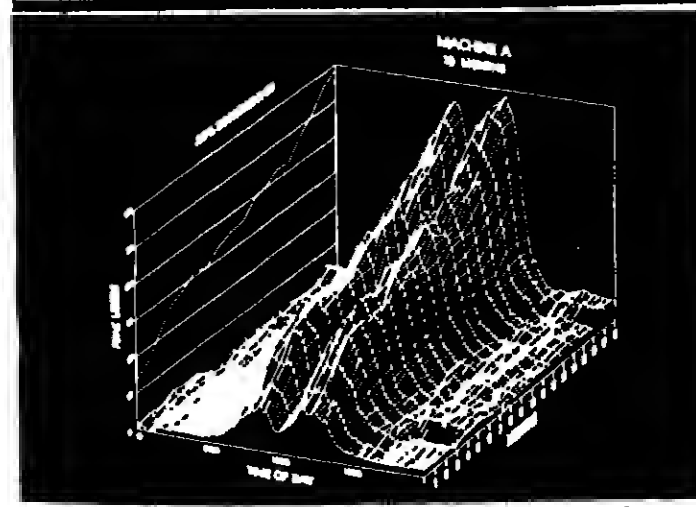
Since the user found it difficult to distinguish data errors from system faults it was necessary to use good quality "test" data, which was both accurate, realistic and representative.

There was a clear advantage for the users in that familiarisation and training could begin early - with the first prototype.

There was less chance of building unwanted elements into the system since any of the designers' faulty perceptions of what the users wanted were filtered out at an early stage.

The need for hardware early in the development was very apparent (early on compared with a sequential development), since system building began after a comparatively short analysis phase.

Guy Thompson is a member of the advisory staff of the Dutch Information Systems House PANDATA (member of the CAP-GENINI-SOGETI group) and specialist in prototyping techniques.



Two main characteristics of the prototyping method are the speed of development and the very high level of user involvement

kened to the stages in building a house, has become accepted as the only sound method for installing a computer system. There are, however, problems which often manifest themselves.

For example the systems users - the people who will actually have to work with the system - are often unclear as to how, on the basis of the "functional design" the system will actually work and what it will do for them. But they must sign on the dotted line that they accept the design (usually rather grudgingly) before the technicians can start.

During the technical construction of the system there is little more than superficial contact between builders and users.

This gives rise to, at best a lack of involvement and at worst polarisation between user and builder, leading to problems with acceptance.

System faults and limitations are discovered only at the end of the line during acceptance trials where they are at their most expensive (in nervous energy as well as in time) to rectify. This is because the first real understanding that the users have of the system is when they see it actually functioning.

The prototyping method was an attempt to remove these sort of problems. As its name implies it is concerned with constructing a series of prototypes of the system, each prototype being a successively refined and extended version of the previous one, until a satisfactory system evolves.

The two main characteristics of

Phase II, Iterations: The first objective is to build a working prototype containing one or more of the major functions of the system.

It is generally felt that the first prototype should be ultra simple since it is primarily to test out basic assumptions; the general structure of the system, to check the development framework, to ensure the software aids work and the hardware configuration is sound, and to ensure the interaction between the development team and the users is harmonious.

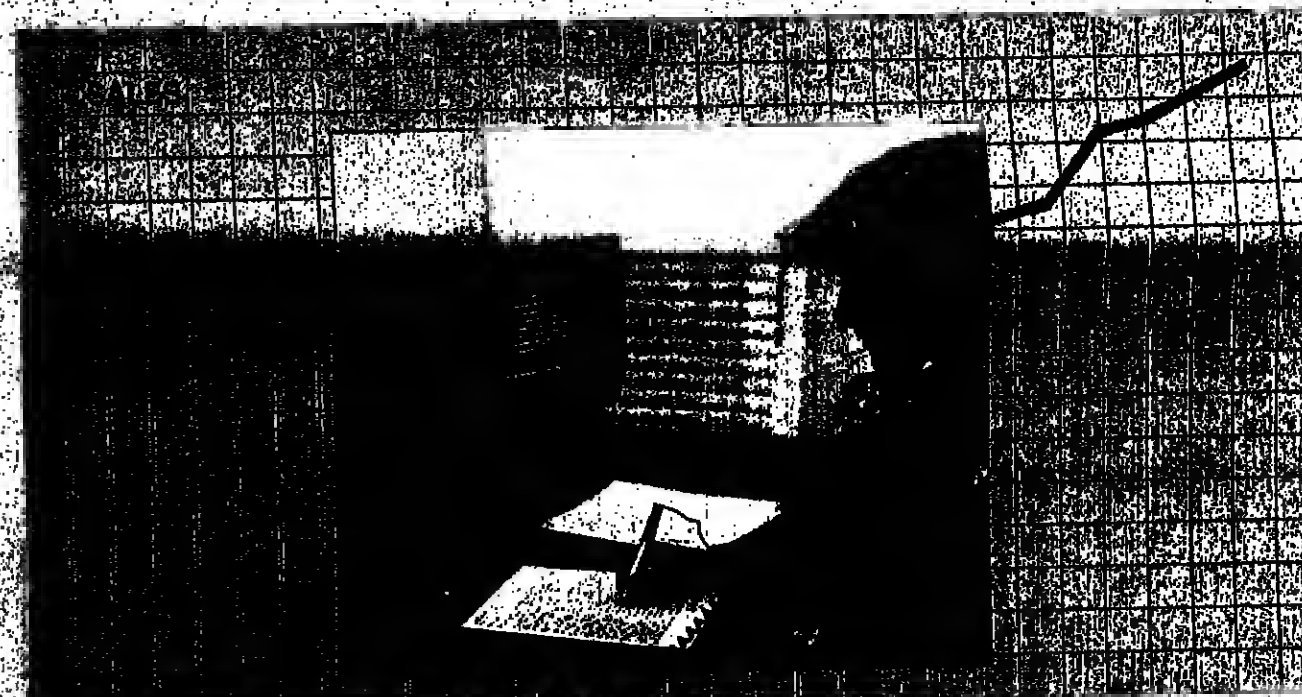
After the first prototype is built (usually in days rather than weeks or months) it is handed over to the user to gain familiarity with and evaluate.

Usually, the first prototype is about 50% correct with 25% excess and 25% shortfall. The necessary amendments are duly documented and carried forward for inclusion in the second prototype. This will include more system functions and more comprehensive data and again the building/evaluation cycle is repeated.

By this time the users are accustomed to the system, having seen it evolve under their own hands, and have reached a stage where the last prototype of the system is accepted as a functionally viable concern.

Phase III, Operational: The last stage in the development cycle is one of converting the functionally sound last prototype into an operational system. This stage is also known as the optimisation, or tuning, stage. Since the objec-

Quicker data capture will capture more of your market.



With the cost of a direct sales force going up and more companies are turning to a telephone sales and ordering operation.

Some are using a conventional VDU and paperwork machine, logging the order and then inputting it into the computer later - separate operations which are time consuming, error prone and costly.

Now there's a simpler, quicker, safer and more efficient way using the Ferranti Hand Print Recognition Tablet. It's a simple, fast, accurate way of capturing data directly from the user. Orders can be entered directly into the computer without any need for a code book. At the same time, you get an immediate check record and confirmation of order from the computer.

The original Hand Print Recognition Tablet can be used for a wide range of applications, from simple data capture to complex systems, and allows a high level of security.

The beauty of Ferranti Tablet entry is that for the Sales department it's exactly like the original paperwork method of operation. So there's minimum operator training. And no duplication of effort. And if your main computer goes down the operator can still go on accepting orders.

The Ferranti Hand Print Recognition Tablet can be converted to most computer systems. It's a connection that will foster increased sales for you!

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Name _____
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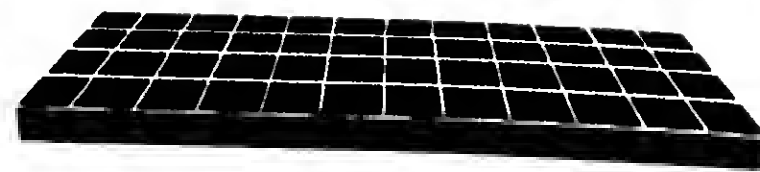
FERRANTI
Computer Systems

An important conference for companies buying products to sell on to the user

The Computer Trade Conference is aimed at the serious computer trader. Manufacturers, suppliers and third party vendors will exchange ideas on the marketing and selling of computer products. Acknowledged specialists will present their ideas on the best ways to tackle third party sales.

Being held in conjunction with the Computer Trade Exhibition, the event is sponsored by Computer Weekly, Micro Business, Practical Computing, Systems International and Software.

The Computer Trade Conference '84



Wembley Conference Centre
March 13-14

TUESDAY, MARCH 13TH

RETAILING

- 8.30 COFFEE AND REGISTRATION
- 9.15 Mass Retailing of Business Micros — Michael Milman, managing director, Greens Business Systems (a subsidiary of Debenhams Ltd.)
- 9.55 How dealers should present themselves — Chuck Hansen, managing director, Computerland.
- 10.35 COFFEE
- 10.55 What Apple expects from their dealers; what Apple gives their dealers in return — Keith Hall, sales and marketing director, Apple Computers (UK).
- 11.55 Retailing through education and training — G. Summers, managing director, Planning Consultancy Ltd.
- 12.25 LUNCH

MARKETING TO THE PROFESSIONAL AND CORPORATE MARKET

- 2.00 Choosing Your Products — Jack Schofield, editor, Practical Computing.
- 2.40 Market products and sales channels — key considerations in the building of the dealer programme — John Crawford, vice president, world wide dealer programmes, Data General Corporation.
- 3.20 Personal computer dealer marketing in 1984 — Nigel Hensell-Thomas, personal computer dealer manager, IBM Ltd.
- 3.45 DEC's approach to the marketplace — Mike Harding, marketing specialist, Digital Equipment.
- 4.10 How to approach the corporate customer — Hal Hovland, joint managing director, Hovland Business Systems.
- 4.50 CLOSE.

REGISTRATION FORM

Please indicate which day(s) you will be attending

13 March
14 March

The fee of £185 plus £27.75 VAT for two days or £95 plus £14.25 VAT for one day covers attendance, coffee, lunch, conference documentation and exhibition admission. Tax invoice will be sent.

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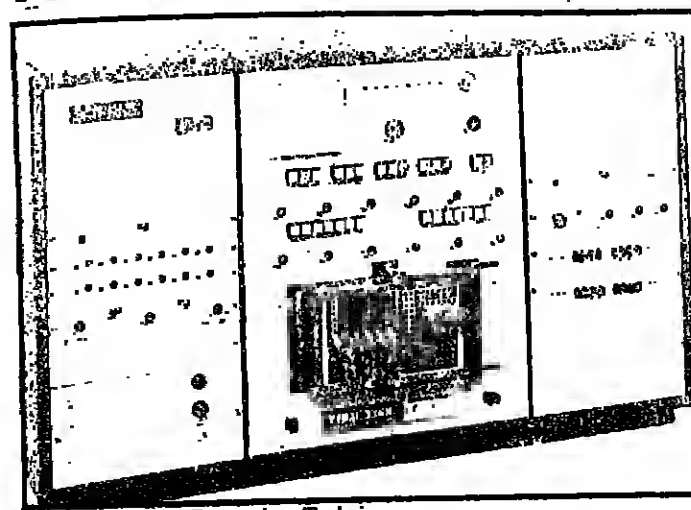
SOFTWARE

- 8.30 COFFEE AND REGISTRATION
- 9.15 Vertical market software — coverage of vertical markets by specific packages varies greatly — some sectors are over-supplied and there are many open opportunities — Russ Nathan, managing director, Romtec.
- 9.55 Procurement — How you evaluate software from various sources — David Turley, director, information systems division, Tamsys.
- 10.05 COFFEE
- 10.55 Marketing Software — The Business Market — Barry Neil, sales manager, Micro Computer Products International Ltd.
- The Games Market — Nick Alexander, managing director, Virgin Games.
- 11.35 Systems and applications software developments — David Fraser, general manager, Microsoft Ltd.
- 12.15 LUNCH — Guest speaker — John McNulty, McNulty's Interchange.

SYSTEMS INTEGRATORS AND OEMs

- 2.00 Communication is the key to office automation — Malcolm Reip, OEM marketing manager, Computer and Systems Engineering PLC.
- 2.40 Discs and Peripherals — Bob Britten, sales and operations manager, Kennedy International Inc.
- 3.20 Printer products and the markets — Alan Clemmensen, consultant, Mannesmann Tally.
- 4.00 Market trends in VDUs and VDU terminals — Harvey Ulljohn, managing director, Lear Siegler Data Products Ltd.
- 4.40 CLOSE.

PRODUCTS



The 336H from Computing Techniques.

Analogue/hybrid addition to Vidac

LATEST model in Computing Techniques' Vidac range, the 336H, is an analogue/hybrid computer, which can interface with general purpose digital computers both for plant or process control and for data transfer.

Leading features of the 336H include mode and computing control by TTL compatible logic signals; modular design, so that expansion units can be added for increased capability; manual control by self-illuminating push-button switches; and independent control of each integrator, permitting interactive solutions of boundary value problems and partial differential equations.

The standard model, available for £5,850, is capable of solving a sixth order differential equation. Computing Techniques has developed a range of non-linear modules to increase this capacity, such as diode limiters, multipliers, function generators and resolvers. In addition, a logic extension unit allows a wider range of logical and control functions to be performed. This unit has a separate

patch panel, linked to the 336H's main patching by 36-way trunk line.

The computer's FET amplifiers use specially selected components to give maximum immunity to drift. Mode selection and analogue system control are achieved by using high-speed FET switches, operated by digital logic.

The 336H is fitted throughout with 0.1% tolerance computing components, and may be operated manually or at fast repetitive rates with time constants down to 1ms. Because of its hybrid capability, the 336H can be linked to any general-purpose digital computer to provide simulation of a plant under direct digital control. This feature has been found to be of importance when education or operator training is carried out on a restricted budget, as realistic simulator instruction can be provided without the need to involve the plant itself.

Computing Techniques Mfg (CW), Brookers Road, Billingshurst, West Sussex RH14 9RZ. Tel: (040) 381 3171.

Automatic telex dial system

ATS Communications of Haywards Heath, Sussex, has signed a deal with Data Dynamics to distribute the ATS range of intelligent telex terminals. They are the ATS Vitel, a telex terminal, and the ATS KM700, a new telex management system.

Part of the deal is for Data Dynamics to do the marketing of the two systems, using a nationwide promotion plan. It expects to attract a large number of users, both large and small.

The KM700 is an automatic telex dialling system that leaves the operator free to carry on with other tasks while it gets on with transmitting the messages keyed into it, re-dialling if a number is engaged, and transmitting all night



The ATS Vitel.

long to coincide if necessary with overseas office hours.

The KM700 does its own billing and keeps a printed record of all transmissions, incoming messages, supervisory functions and any unsuccessful attempts to connect with the telex network.

ATS (CW), Brookers Road, Haywards Heath, Sussex RH16 1UB. Tel: (0444) 414911.

Three-in-one printer

VERSAPRINT 500, Lear Siegler's new printer series, offers colour dot addressable graphics, near letter quality (NLQ) and 180cps printing output, for under £1,400.

In near letter quality mode at 45cps and using a 14x18 character matrix, the output is almost indistinguishable from typewriter quality, says Lear Siegler, while in draft mode VersaPrint operates at 180cps and, using its microprocessor and bidirectional printing facilities, seeks out the fastest way of producing hard copy.

Lear Siegler Data Products (CW), Orchard House, Connaught Road, Brookwood, Surrey GU24 0AT. Tel: (048 67) 80666/7.

Filtering out interference

A FILTER plug which can be fitted to the computer supply cable in place of the standard 13-amp square pin plug, is introduced by Galatrek International. It is designed to protect micro and minicomputers, word processors and all voltage sensitive equipment from mains born interference.

The small unit will protect equipment from transients and spikes which can wipe out memory and corrupt data, says Galatrek. The filter plug also protects from momentary outages, mains RF interference and lightning disturbance. Price is £29.95.

Galatrek International (CW), Scotland Street, Llanrwst, Gwynedd, North Wales. Tel: (0492) 640311.

Hand computer has 3,100 bytes built-in

CLOCK and calendar functions, text-file editing and extended memory are among the built-in features of the HP-41CX, a hand-held computer announced by Hewlett-Packard.

The new computer includes all the features of the HP-41CV, plus built-in time and extended functions/memory modules, a text-file editor, and 20 new commands. The HP-41CX has over 3,100 bytes of memory built-in.

A built-in time module enables the HP-41CX owner to use the calculator as a time-based system controller, an alarm clock, a timer or an advanced stopwatch. In addition to the standard time module functions, the HP-41CX has five new time commands designed to improve alarm capabilities and time operations.

The built-in extended functions/memory module has 868

bytes of extended memory, extended memory-management functions, programmable versions of several HP-41 functions, and several register and flag manipulation functions.

Other features of the HP-41CX include an RPN (Reverse Polish Notation) operating system, in 24 Kbytes of ROM, that allows users to see intermediate results and recover from errors easily.

The alphanumeric keyboard is redefinable, so users can assign their most frequently used programs or functions to any key for quick access and execution. Keyboard overlays are also available for HP-41CX users who want to label redefined keys.

The recommended retail price is £229.71, exclusive of VAT.

Hewlett-Packard (CW), Eskdale Road, Wokingham, Wokingham, Berkshire RG11 5DZ. Tel: (0734) 696622.



The HP-41CX with more than 200 built-in functions.

We have the edge.

Just as we have the edge over our competitors — you can have the edge over yours. Because from now on Cullinet's unique integrated software system IDMS/R makes the full promise of computers come true.

IDMS/R, with its automatic system facility (ASF), makes your IBM mainframe as easy to use as a personal computer.

With ASF you can develop an application in seconds by simply defining a relational record. ASF then dynamically generates all necessary supporting structures including data definitions, screen formats, application processing logic, and documentation. This makes ASF a major advance over 4th generation languages.

However, you need outstanding performance to build a complex, high volume production application. Typically 6% of the data relationships (joins) in any applications are accessed 95% of the time. With IDMS/R you simply change these relationships to predefined joins and benefit from a dramatic boost in performance.

We call it Relational Fastpath. This is what makes IDMS/R a unique relational DBMS, and a perfect system for your production applications. IDMS/R has the most sophisticated back-up and recovery capability of any DBMS, a full integration with personal computers and a complete line of integrated financial and manufacturing applications.

But then Cullinet has always had the edge.

We introduced the 1st dictionary driven DBMS. And we've kept ahead with continuous research and investment producing sophisticated tools based on proven techniques. Call us and we'll prove it.

At Cullinet we believe there's no such thing as second best.

Cullinet

Cullinet Software Ltd, Cullinet House, The Broadway, Stanmore, Middlesex HA7 4DU. Tel: 0647 3333. Telex: 8951901 CULLUK G

PRODUCTS

Filter aims to reduce stress

POWER SCREEN is a new type of visual display unit anti-glare filter, introduced by Power Equipment, designed to go further than conventional filters in reducing word processing operator discomfort and fatigue.

In addition to eliminating screen glare and reflections, which can cause eyestrain, the new filter has an electrical cathing lead. This prevents the electric field, produced by the electrostatically charged screen, from affecting the operator, says Power Equipment.

With the filter in place, text on the VDU screen is easier to read, because most of the light seen by the operator is generated on the screen and not reflected. By eliminating reflections, contrast is improved and the operator sees a clearer, sharper image which reduces eyestrain.

The extra benefits of the earthing feature are based on recent health and safety research.

According to these studies eliminating the electric field will reduce skin and eye irritation and dizziness which are common complaints from operators during prolonged use of VDUs.

Available in a wide size range, the filter is a lightweight device which fits over VDU screens using

adhesive pads or magnetic strips. The unit consists of a matt black aluminium frame holding a black nylon mesh filter. Joined to the frame is an earthing lead which clips on to any earthed metal work.

Power Equipment (CW), Kingsbury Works, Kingsbury Road, London NW9 8UU. Tel: 01-205 0033.

The anti-glare filter from Power Equipment, designed to reduce operator discomfort.

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Plessey firms up its image in the office

PLESSEY has strengthened its hand in the office systems marketplace with two new 16-bit workstations.

Plessey Office Systems has developed its own 16-bit business micro, based on the Intel 80186 processor, and is looking for distributors to sell the machine and write software for it.

The final end user price, including business software, will be about £2,000.

The company has also announced a multi-user workstation made by Convergent Technology in the US, and adapted to link up with Plessey's own private automatic branch exchanges (PABX).

The Convergent machine is on an OEM basis by several companies, including Honeywell and Prime, and is fast becoming the industry standard office workstation.

It also offers local area networking, for sharing services and electronic mailboxes, which are linked up with a PABX, nearer to the idea of a system.

"We aim to offer a complete range of products for different market segments," says a spokesman.

Plessey Office Systems (UK) Ltd, Broomfield, Nottingham NG16 4JL. Tel: (0602) 254822.



Plessey's new business computer.

Sheet feeder clips on to the printer

COMPUTER users looking for accessories such as paper feeders and acoustic hoods can get a new range from ABS Data.

First there is what ABS claims to be the simplest and most reliable sheet feeder available. The ABS Paper Aide clips on to the printer in the same way as a tractor feed. The drive is taken directly from the printer platen gears, so no electrical connections are needed.

The feeder can handle sheets measuring up to 17.75 inches by 15. It can take 150 sheets and the stock can be replenished without interrupting printing. It uses the full platen width of the printer, so there is no need to adjust the margins on existing documents. Single envelopes or sheets can be fed in without removing the feeder.

The Paper Aide works with Qume Sprint, Diablo and AES

Daisy and Alphaprint printers. Costs £495. Special versions can be provided for other printers.

The second feeder from ABS is the dual-tray ABS Paper Manager with its own memory. It can store addresses and print them out envelopes. The unit works with Qume Sprint and AES printers. Prices start at £1,095. The ABS Paper Manager, without the memory, starts at £795.

The new acoustic hoods are available for 13in and 26in printers. They accommodate the paper-feed device.

The electrical components, including the cooling fan, are contained in a module which can be removed for quick servicing.

AES Data (CW), 170 Watford Road, Sunbury-on-Thames, Middlesex TW16 7HH. Tel: (09327) 85631.

Mainframe to micro link

NORSK Data has introduced the ND-100CC communications controller, a standalone device that can link most mainframes, minis or micros.

A 16-bit microcomputer in its own right with up to four megabytes of MOS memory, the controller provides local offline data processing, word processing and disc storage facilities, and under software control allows up to 25 micros, VDUs and/or printers simultaneous access to one to four remote computers.

Prices for the basic unit start at £16,250 with up to 45Mbytes of integral Winchester disc storage. A simple remote installation, with two screens, a multi-function printer and word processing software would cost about £23,000.

Norsk Data (CW), Strawberry Hill House, Bath Road, Newbury, Berkshire. Tel: (0635) 33344.

Editing terminals

A RANGE of editing terminals for information providers has been introduced by Bishopgate Terminals.

The BT1-14 basic editing terminal has a compact keyboard layout controlling all terminal functions, and non-interfered display. Of special interest for editing purposes are its wrap-around feature, correcting the over-run, line/character delete, insert and shuffle, offline and online editing, and whole page store and transmission.

The model 14/40 has 40 pages of local memory held in RAM, so that frequently-used pages, or those carrying information which has to be copied down, can be viewed and edited after the terminal has been disconnected from the telephone line.

Bishopgate Terminals (CW), 32 Manor Way, Old Woking, Surrey GU24 0JA. Tel: (0482) 77441.

PRODUCTS

Fastest channel rate claim by Storage Tech

STORAGE Technology has announced the 4670, a 200 ips magnetic tape subsystem for IBM and IBM-compatible system users.

The 4670 is claimed to be the industry's first compact, high performance, stop/start tape subsystem offering an optional maximum data rate of three Mbytes per second - the fastest channel rate currently available on standard business computers.

Brian Hicks, marketing services manager, said: "Depending on the number of units in a configuration, the 4670 saves users between 25% and 47% in floor space and 50% in power and cooling requirements, compared with other similar speed subsystems."

"A properly configured 4670 with on-board buffer option, can sustain up to a 2.93 Mbyte per second data transfer rate to CPUs operating on a three Mbyte per second channel."

"The buffer is a 32 Kbyte random access memory capable of matching 3.0, 2.0 and 1.5 Mbytes per second channel speeds."

"The 4670, with the buffer, can be placed up to 400 feet from CPU, on the data streaming channel."

"Previously 200 ips drives were limited to 120 feet."

The 4670 tape subsystem is fully compatible with IBM 370, 303X, 4300, 308X and equivalent processors.

Storage Technology's buffer feature manages data between the controller and the tape drives,

freeing the channel to serve other devices.

By storing data temporarily at the buffer, the 4670 control unit is able to operate in block multiplex mode, permitting concurrent tape operations to occur on the same channel.

And the buffer transfers data at full channel speeds - up to three Mbytes per second - when communications between the control unit and the central processing unit are re-established.

Consequently, the 4670 can nearly double data throughput on two Mbytes per second channels, and triple data throughput on three Mbytes per second channels, provided the appropriate control unit and channels are available, says Storage Technology.

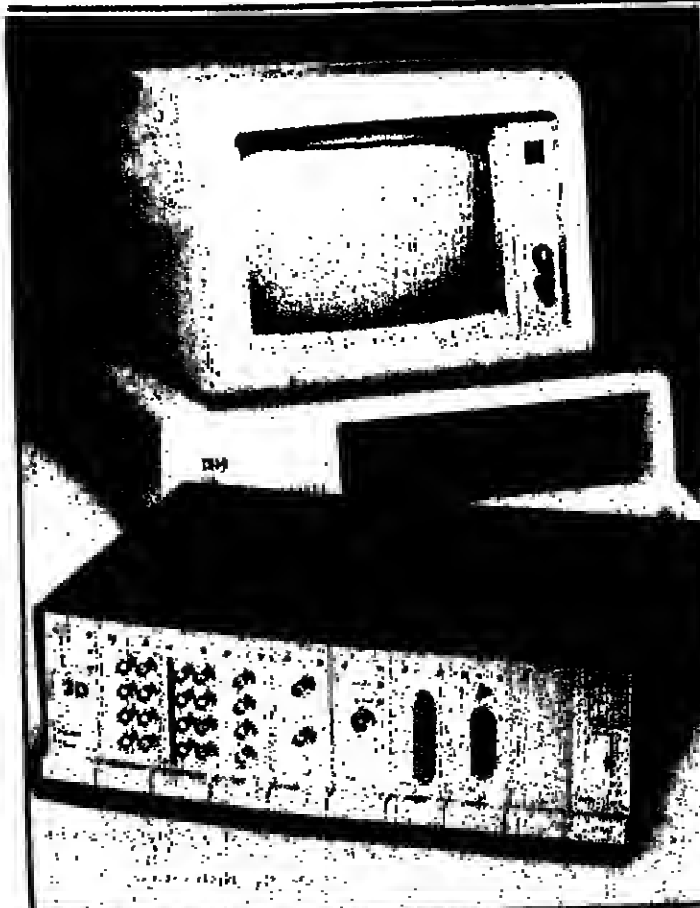
Each 4670 is equipped with its own diagnostic microcode housed on a floppy diskette.

The subsystem provides for complete user-initiated diagnostics and fault isolation of each unit to the printed circuit level, by specialists at the remote diagnostic centre.

Since these diagnostics are "in-line" tools, the remainder of the subsystem will continue to be available for data processing while fault isolation occurs transparently to other activity occurring on the subsystem.

The diagnosis is accomplished using standard telephone lines.

Storage Technology (CW), Churchstun House, Portsmouth Road, Esher, Surrey. Tel: Esher 67041.



Interface system for the IBM Personal Computer.

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MARKET PLACE

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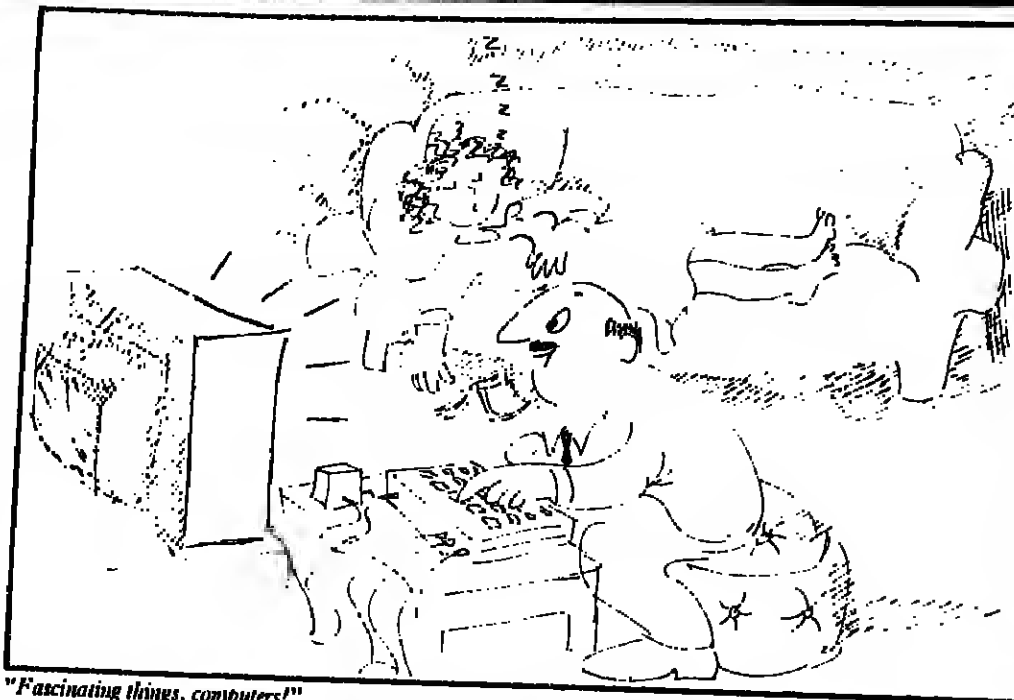
Nice text, shame about the pictures

The Micro Maze: A Guide to Personal Computing. Wynford James. Micro Press, Tynbridge Wells. £5.95

YET another introduction to microcomputers has hit the market in the shape of *The Micro Maze: A Guide to Personal Computing*, from former mathematics teacher and now ICL technical author, Wynford James.

Like the others, it has the obligatory potted history of computing, the usual introduction to binary arithmetic and the internal workings of the machine, chapters on programming and peripherals and a guide to choosing a computer, including brief reviews of some popular models.

The book has little chance of winning attention on bookshops' shelves alongside other, flashier offerings covering exactly the same ground. The few photographs are uninspired and have not reproduced very well, leaving the visual



"Fascinating things, computers!"

relief largely to a handful of indifferent cartoons.

This is a great pity, because the text is excellent.

Even when describing how a computer works, the author resists the temptation to get too bogged down in technical language. Throughout the book he makes simple but extremely effective

comparisons between the way computers work and the way humans behave.

The result is a very clear picture of what microcomputers, peripherals and programming are all about, even for the beginner.

The book is aimed at home, business and education users but concentrates on the very bottom of

the market, talking of microcomputers in terms of television sets, cassette recorders and Basic. In fact, the author suggests the Logo teaching language will be the most popular language after Basic. This is misleading for potential business microcomputer users.

John Kavanagh

Robots as MPs? Back to reality

Reinventing Man: The Robot Becomes Reality. Igor Aleksander and Piers Burnett. Kogan Page, London. £9.95

ANYONE worried about questions like, "Should a robot be allowed to stand for Parliament?" and "Would you let your daughter marry one?" will be reassured by *Reinventing Man*, a look at the reality of robots by researcher Igor Aleksander and writer Piers Burnett.

Most of the book is an excellent description of today's robots, how they work and their use in industry. It shows that robots still have a very long way to go before they come anywhere near competing with humans.

But the book also goes much deeper, back to the roots of robotics both in science fiction and in the ideas of Norbert Wiener, a founding father of modern robotics. It suggests that the early success of some of his ideas led to the development of today's robots, which imitate human actions on assembly lines.

But, it argues, this limited success meant Wiener's more important ideas were ignored - to bring robots which imitate the human mind to work.

That involves recognising and working from patterns of data rather than following simple program instructions or rules as those governing chess games.

The last third of the book goes into a pattern recognition project worked on at several UK universities by Igor Aleksander and others to develop this idea.

After the readable and down-earth description of robots and artificial intelligence this section comes too much of an academic paper - and, one suspects, a prelude for further research.

Certainly the authors' claim to be writing for the layman wears thin here.

For all that, the book's 30 pages provides an interesting comparison between the practical aspects of robots and man's aspirations for them.

John Kavanagh

Putting the computer firmly in perspective

Computer Power and Human Reason, by Joseph Weizenbaum. Penguin Books (Pelican), £2.95

WEIZENBAUM states in his introduction that this book is not primarily about computers. Computer science (of which he is a professor at the Massachusetts Institute of Technology) is used as an example to illustrate his main concern: the reluctance of scientists to accept responsibility for the potentially disastrous effect their work can have on the world.

As he admits, this is not an original view, but it is certainly worth repeating, and Weizenbaum argues his case thoroughly and convincingly. This, however, is only in the last chapter of the book. The preceding nine chapters explain computers and their limitations.

The author is particularly scathing about the wider claims of the artificial intelligence, especially the notion that man can validly be regarded as nothing more than an

information processor, and that, in theory, he precisely emulated by a computer.

His concern is expressed in his conclusion that "since we do not now have any ways of making computers wise, we ought not to give computers tasks that demand wisdom".

In his desire to preserve academic integrity, Weizenbaum pounds his arguments with a degree of detail which lay readers may find excessive, though the result is to make his case luminously clear and watertight.

The book was first published in 1976, and while technological developments have in no way invalidated it, the claims for artificial intelligence have to some extent been moderated in the interval.

This, however, is a minor detail. *Computer Power and Human Reason* is a brave and thought-provoking book, and its central theme is of the greatest importance to scientist and layman alike.

Hugh Busby

Is C really worth it?

Learning to Program in C. Thomas Plum. Prentice Hall, Englewood Cliffs, New Jersey 07632.

THE Unix wagon marches on, carrying along the programming language C. Unix, I grant, is here to stay, but is C the best programming language for writing business applications?

Or is C just a piece of trendy ephemera that is going to fall by the wayside of languages like RM Cobol?

Certainly, the language has its critics, who argue that it is too academic and hard to maintain. Use instead a language like RM Cobol, they exhort, which is far more portable among programmers, if not among machines.

Readers are left to judge these issues for themselves in Thomas Plum's *Learning to Program in C*. They are given a pretty exhaustive technical treatment with plenty of examples of C programs, but the book lacks a wider perspective.

The question, "Why write in C?" is left largely unanswered. The author does go on about portability and efficiency: it is true, but fails to offset this with the difficulties of writing good code in C and then maintaining it. Plum describes his book as a

tutorial rather than a manual. In this he can be credited with some success, but he has not entirely managed to escape the manual mentality that bewitches writers of books about computing.

The prose is of fair quality, but I feel that several times the author has not quite risen to the occasion, and falls to think clearly enough. As a result the reader is sometimes left to unravel the detail.

The text is split clearly and sensibly into chapters on data, operators, statements, functions, pointers and structures. There is also a chapter on software development, which is useful but could have been developed further.

An important aspect of C is the use of pointers. On this matter, Plum does well, and draws our attention to the key fact that the value of an unassigned array in C is equal to the address of the first element of the array.

A pointer variable holds only an address, and C allows integers to be added to pointers, with automatic scaling of the answer by the number of bytes in the variable. This technique allows machine-independent address arithmetic to be performed.

Philip Hunter

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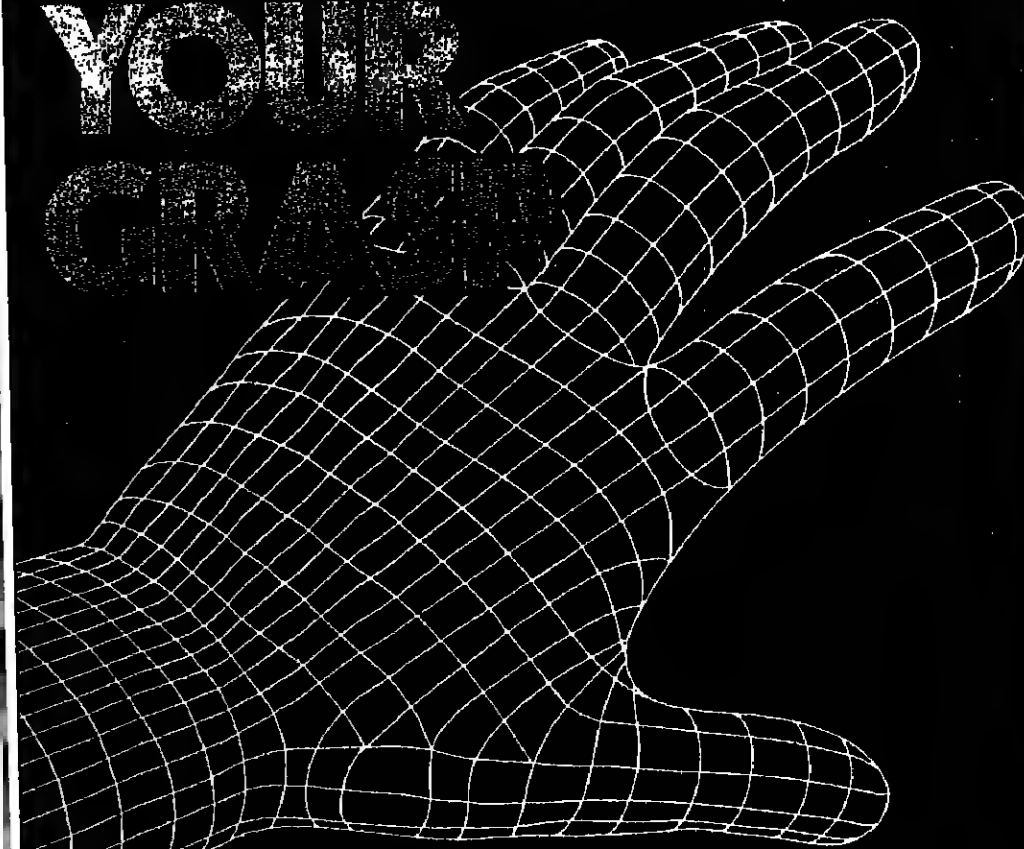
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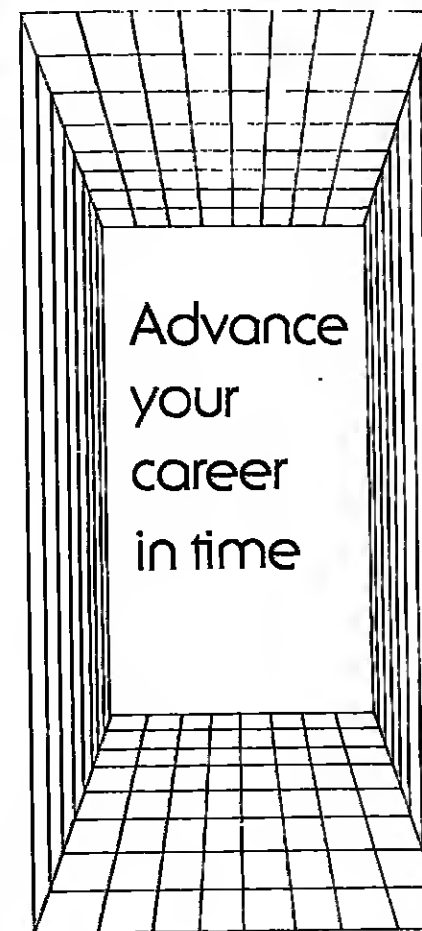
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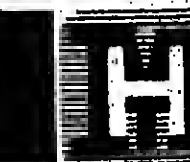
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Technical	IBM 4300 Applications Programmer	£1381	K1381
Technical	Wang VS RPGII Analyst/Programmer	£1396	E1396
Technical	DEC VAX VMS MACRO 32 Programmer	£1393	E1393
Technical	DEC PDP 11, RSX 11, COBOL Senior Programmer	£1392	E1392
Technical	HP3000 + related software. Programmer & Analyst/Programmer	£1410	P1410
Technical	Redifon R Range, Editor, Programmers	£1408	P1408
Technical	IBM 4341, COBOL, CMS, VSAM, Micro knowledge advantageous	£1409	P1409
Technical	12 months - £10,000 salary	£10,000	P0897
Technical	ICL DMS Business Consultant, Local Area Network, 8 months - Manchester	£10,287	P0287
Technical	Micro, Assembler, Pascal, Comms. Programmers. 6 months +	£10,557	P0557
Technical	ICL DMS Programmer, Pascal 'C', ASAP - Manchester	£10,797	P0797
Technical	UNIX Programmers (Micro)	£11,353	P1353
Technical	Honeywell DP58 Business Consultant - 6 months - Manchester	£11,385	P1385
Technical	Datapoint, RMS - Urgent - Middlesex - c. £450 per week	£450	P1371
Technical	ICL 9900, VME, COBOL, IDMS, TPMS (Not essential) To start ASAP - London/Wiltshire	£450	P1110
Technical	DEC PDP, RSTS, BASIC + Programmers, Analyst/Programmers - Urgent - London	£450	P1110
Technical	Real Time Process Control - Herts. c. £450 per week	£450	P1110
Technical	ICL 9900, VME, VME/B, DBS, IDMS, TPMS. All positions from Programmers to Business Consultants and Designers - Urgent - all areas	£2000	S2000
Technical	FORTRAN + - URGENT - Senior Programmer. Start date March - long term. Must have min of 5 years Real Time Data Acquisition and control. To work on Norsk Data. Interesting and involved application - Oxford. c. £500 per week	£500	S1403
Technical	FORTRAN 77 Programmer with possible experience of IBM 3081 and MVS. Nord 100 experience useful (not essential) Oxford. c. £450 per week	£450	S1404
Technical	ICL Designer IDMS - ASAP - 6-12 months - Birmingham	£1316	S1316
Technical	ICL Designer IDMS, TPMS - Bucks	£1372	S1372
Technical	ICL 9966, IDMS, TPMS Performance and training specialist - Bucks.	£1405	S1405
Technical	ICL 9900, VME, IDMS, SCL - 6 months + Analyst/Programmer. Good for live time contractors - City. £375 per week	£375	P1406
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CONTRACTS

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IBM PC Programmer wanted for 3 month assignment starting end of March. Must have Focus experience. c. £400 per week. Ref: K1400

IBM 4300 Applications Programmer. Essential skills CICS, VSAM and VMS. TSO would be useful. 3 month assignment. Ref: K1381

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DEC VAX VMS MACRO 32 Programmer - London Ref: E1393

DEC PDP 11, RSX 11, COBOL Senior Programmer - ASAP - Farnborough Ref: E1392

HP3000 + related software. Programmer & Analyst/Programmer - All areas Ref: P1410

Redifon R Range, Editor, Programmers - South London Ref: P1408

IBM 4341, COBOL, CMS, VSAM, Micro knowledge advantageous. First contract in Central London. 12 months - £10,000 salary. Ref: P1409

ICL DMS Business Consultant, Local Area Network, 8 months - Manchester Ref: P0897

Micro, Assembler, Pascal, Comms. Programmers. 6 months + Ref: P0287

ICL DMS Programmer, Pascal 'C', ASAP - Manchester Ref: P0557

UNIX Programmers (Micro) Ref: P0797

Honeywell DP58 Business Consultant - 6 months - Manchester Ref: S1353

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FORTRAN + - URGENT - Senior Programmer. Start date March - long term. Must have min of 5 years Real Time Data Acquisition and control. To work on Norsk Data. Interesting and involved application - Oxford. c. £500 per week. Ref: S1403

FORTRAN 77 Programmer with possible experience of IBM 3081 and MVS. Nord 100 experience useful (not essential) Oxford. c. £450 per week. Ref: S1404

ICL Designer IDMS - ASAP - 6-12 months - Birmingham Ref: S1316

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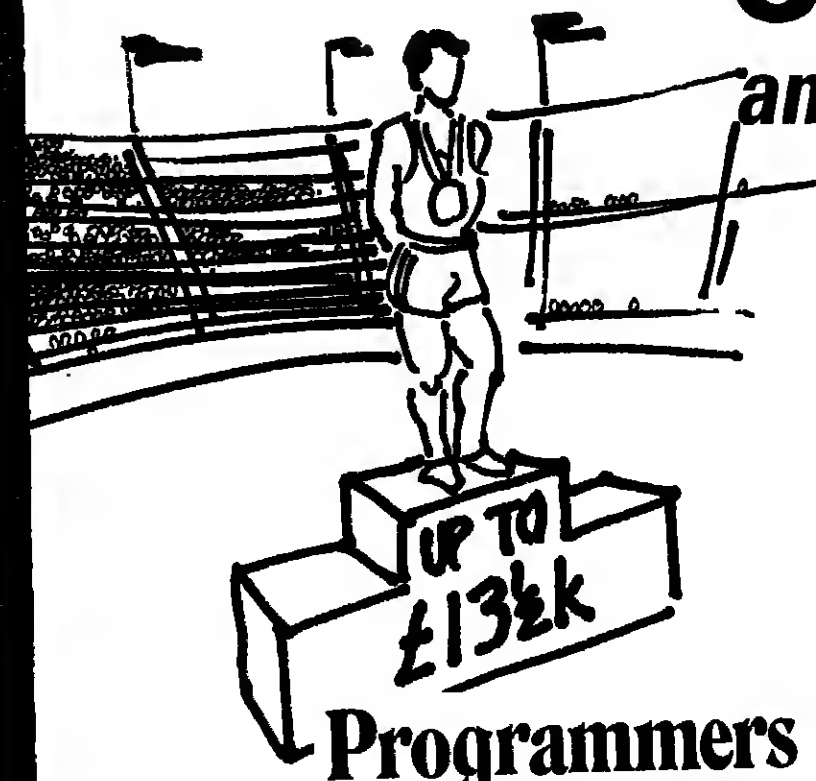
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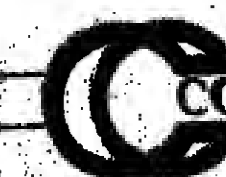
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If you have at least 5 years' experience with large IBM Mainframes utilising such skills as PL1, TSO, SPF, etc, and more recently have been involved in D.P. training, you could be joining the education and development team of an international company that boasts one of the largest D.P. centres in the Middle East.

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Our profile calls for a software engineering professional who has gained considerable experience in developing and implementing guidelines for software design and development. You should have experience of working with large scale software and understand modern design technology.

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061-933 0427

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LONDON AND THE HOME COUNTIES

RPG - ALL LEVELS CENTRAL LONDON

The IBM GSO range is now a market leader in small to medium business systems equipment and the call for RPG programmers is stronger than ever. Several clients with applications have asked us to recruit for them. There is a wide range of choice in environment and position, with something of interest whatever the level. At this point it is more a matter of choice of which offer is always more interesting. If you feel that a change of job could give you more interest, experience, salary or promotional prospects then please contact Marshall Cligman in London for an informal discussion.

BANKING SECTOR £12-21K Pkge + Car

Opportunities have arisen at various levels for candidates with experience at PROJECT LEADER, DESIGN or PROGRAMMING level in BASIC, SASI, C++ or PRO-TIME applications to join an established Systems House and consultancy. Excellent careers are available in either development or support roles working with BANKING, COMMERCIAL or MESSAGE SWITCHING applications in the city or ASROAD. An attractive salary, reviewed regularly and supplemented by a generous benefits package, is available for the right people.

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A leading software house have a series of current requirements for PROGRAMMERS with good COMMERCIAL experience. Because of the wide range of services and machines they have a general call for people with a COBOL, BASIC or FORTRAN background. The nature of the work is varied and data will be required to demonstrate the ability to shoulder responsibility for client contact at all levels. A HIGHLY COMPETITIVE salary with a generous BENEFITS package will be offered with a CAR for more senior positions.

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£14.5K MANUFACTURING

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MAJOR RETAIL COMPANY £12K W. LONDON

A household name in retailing based on the West London borders have development plans envisaged to last well into the late 80s. The company are currently running three ICL ME22s using TIME/MTS and are heavily committed to IMS and ANALYST/PROGRAMMERS with a minimum of 18 months' COBOL experience to join the team. Areas of development include: Point of Sale, Stock Order Entry and a large Warehouse Automation project. If you have been involved in similar systems and feel you can contribute to this company's growth then call us now for an immediate interview.

YOUNG H.P. PROGRAMMER £8-9.5K + Prospects

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DEC VAX £s NEG CITY

At the heart of the City lies the pulse heat of international trade and finance and for exceptional PROGRAMMERS and ANALYST/PROGRAMMERS the chance to be involved in a richly rewarding environment. One CITY INSTITUTION with DEC VAX using BASIC need high calibre staff for a series of new projects and developments. Previous applications experience is not important as this client is looking for flexibility and potential, with a preference shown towards individuals who can demonstrate these essential skills. Some involvement with MACRO or operating systems would be useful. A GOOD BASIC SALARY with a GENEROUS BONUS SYSTEM is on offer.

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Our clients are tremendously successful in the LONDON insurance sector and part of major international concerns. Appraisal of 1984 developments has identified requirements for young Programmers with one-two years on IBM mainframe using PL/I or COBOL. The position will provide the opportunity to work with ON-LINE and DATABASE systems in an environment where TRAINING and CAREER DEVELOPMENT are considered of vital importance.

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One of the world's leading petrochemical companies are developing their commercial applications to such an extent that they now require further DP professionals to supplement their existing team. The ideal candidate will be a graduate with a minimum of one year's commercial programming experience using COBOL in a medium or large IBM installation using MVS, TSO/SPF, CICS and/or DL/I, as TRAINING in the use of ON-LINE and DATABASE techniques will be provided. This is an ideal opportunity for people who wish to move into a more technically demanding position.

TCR

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SA

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We have a wide range of requirements for programmers with experience of IBM, ICL, UNIVAC, DEC, PRIME or HP throughout the UK with database and TP experience being an added advantage. We are also looking for a number of systems analysts with sound manufacturing systems experience on any hardware for long term contracts.

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If you have experience of "Time-Critical" applications and a knowledge of CORAL, BAS-BAGE, FORTRAN, RTL, MASCOT, assembler, etc, we probably have a contract to suit you. Contracts range from 3 months to 18 months initially. We need people to work throughout the UK and overseas.

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(7849)

Communications Designer

BERKSHIRE

Up to £14,000

A major manufacturer of minicomputers is seeking Programmer/Designers to develop communications systems. The project involves support, design and development of X25 Level 2 software and LAN Link level software for Unix System III-based workstation.

Candidates should have practical experience of X25/HDLC or similar protocols. Additional experience of Pascal, C, Unix is highly desirable.

Successful candidates will gain valuable experience in the implementation of the lower four layers of the OSI model including Network definition and control.

CW 7/4

Florida

NETWORKS/X25

Up to \$50k

One of the world's most innovative producers of communications and information systems is currently seeking to recruit additional Comms experts to work at their laboratories in Florida.

The company is looking for experts with two main areas of expertise: Data communications specialists, requiring highly qualified candidates with experience of X25 and related protocols, package switching and network diagnostic equipment experience.

The second area calls for Network software specialists; at least two years experience of VTAM, BTAM and NCP. Additional experience of a COMTEN or IBM 3705 hardware is desirable.

In addition to the technical skills to be gained, the company provides a comprehensive benefits and relocation package.

CW 7/10

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01-399 9183

Datamatics, Freepost, Surbiton, Surrey KT6 5BR

Communications Manager

BERKSHIRE

Up to £18,000 + bonus + car

The Computer and Communications Manufacturers Business Section of a major systems house have created a new Account manager's position to assist in the development and management of this important business area.

This position calls for the combined ability of (A) selling/marketing the company's services and (B) a solid systems development background with more recent experience of communications systems, e.g. IBM Comms, ICL Comms, X25 and LANs. Finally, candidates should possess project management experience preferably with some financial and contractual responsibilities.

This position offers the successful candidate the platform to assume further business responsibility in the future.

CW 7/3

Coral/Mascot

LONDON/SURREY

Up to £15,000

A leading consultancy commanding large contracts with the MOD requires professional Programmers and Software Designers to work on Realtime systems. Candidates should have a degree plus experience of Coral and preferably Mascot. Experience of Context and VAX machines would be helpful.

Successful candidates may look forward to enhancing their careers within an organisation proud of its reputation for professionalism and career development.

CW 7/5

C³ Development

LONDON/HOME COUNTIES

£16K + Package

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Candidates should have a numerate science degree and have at least five years' experience in Defence Communications, working on large projects like Pismigun, BATES, etc. Candidates should have a thorough understanding of communications systems, analysis and design.

CW 7/6

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DEC Programmers

Guildford to £11,000

Our client, part of a major group of companies, is a young, dynamic software house looking to recruit experienced programmers, who will enjoy being part of a growing company and making their own effective contribution to its growth. Client contact is an important part of the job—which means that we are looking for able communicators who are articulate, presentable and in possession of a wide range of technical skills. These technical skills will include programming in COBOL and/or BASIC, (on commercial applications using DEC equipment) program testing and, ideally, program specification writing.

In addition to the skills you bring with you, you will subsequently acquire others—in particular on micro-computers (including SIRIUS and APRICOT). The systems you will be developing will be both batch and on-line.

To apply for these and other positions, please contact Joan Ainsworth on 01-681 8317 or write to her at Computer Search & Selection, 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey, CR0 9XF.

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Ideally, you should have solid systems and programming experience, gained in an IBM environment, together with specialised telecommunications skills — preferably distributed data processing.

Reporting to the M.S.M., you will be an experienced man-manager — possibly a Project Manager seeking to move up the ladder and play a major role within a rapidly expanding and dynamic company.

If your experience is relevant, you are interested in working on the Surrey/Hants border, a COMPANY CAR and believe you are worth up to £18,000 plus and substantial benefits then phone

Stuart Blake on Farnborough 516141 to arrange a confidential interview. Alternatively send detailed c.v. quoting ref: SB420

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OEM Sales
DP Sales
European Sales

Knowledge of software, an understanding of the micro software market and a technical background will all be useful. A proven track record in selling is essential. For European Sales communication ability in French/German is vital.

Product Marketing
Marketing Services
Marketing Communications
Public Relations

We seek bright, articulate people with the experience and flair to contribute in these fields. A background in the software industry is essential with the ability to demonstrate proven success in your current area of expertise.

With a growth rate such as ours the career and salary opportunities are exceptional. Your drive and commitment can thus be well rewarded. As well as excellent remuneration, benefits will include relocation assistance where appropriate.

For further information concerning any position contact:
Miss Ann Jackson, Micro Focus Group Limited
26 West Street, Newbury, Berkshire.
on 0635-33518 (Direct) or 32646 x223
or clip and return the FREEPOST coupon to Myriad quoting
MF/1802/CW

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- * Experience of IBM 3270 (either as user or designer)
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Ideally you will be qualified to degree/equivalent level and will have a proven track record in data communications. These positions represent once in a lifetime opportunities to radically develop your career and lifestyle in one of the world's key locations within a tremendously successful organisation.

Contact: Shaheed Ahmed, B.Sc.
Please telephone or write to Kramer Westfield International Ltd., 25 Victoria Street, Windsor, Berks, SL4 1HE.
Windsor (07535) 36155 9.00 am to 7.00 pm.
Recruitment consultants in the data communications industry.

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THE DP ENVIRONMENT

Currently an IBM 4341 model 2 running MVS, CICS, DL/I and COBOL, with a 3083 model E due to be installed in March. In addition, Hoechst is committed to personal computing, with 19 Apples in use under the guidance of an Information Centre.

THE VACANCIES

Two project leaders are required initially, with further expansion planned. They must be experienced systems analysts, preferably - but not essentially - with an IBM background and a good understanding of TP and database concepts and practice. Similarly, the successful applicants need not be former programmers, but they must be able to lead a programming team. The principal qualities needed are powers of leadership, self-motivation, and the ability to take a project from feasibility to implementation.

It is unlikely that candidates with less than four years' relevant experience will be suitable.

PROJECT LEADERS

to £15,000
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THE REWARDS

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and the many other advantages that only working for a major multinational corporation can bring.

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is to telephone 01-499 1948 for an application form, quoting ref: GM/2/73, or write with a FULL cv to Geoff Mackenzie, P-E Appointments Division, 166 Piccadilly, London W1V 9DE.



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S-COM Computer Systems Engineers is a rapidly expanding software engineering company. (Our turnover has roughly trebled in each of the last three years). Our main expertise lies in the development of systems involving communications (military, telephonic, area networks), process control, graphics and mathematical applications.

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1. Knowledge of JSP 188 standards
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4. Five-eight years' industrial experience for the more senior position
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The above posts are open to applicants seeking both

CONTRACT or PERMANENT employment.

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For further details of other vacancies, please call or write to Graham Blekoe.

FOR DETAILS OF OTHER VACANCIES IN S-COM (CONTRACT OR PERMANENT) PLEASE CALL OR WRITE TO LAWRENCE MILLS.

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Tower House, High Street, Aylesbury, Bucks. Tel: 0296 32023
Evenings after 7pm or weekends 0296 32055

THE MICRO TECHNOLOGY GROUP



The Micro Technology Group, founded in 1978, is now one of the most firmly established systems houses in the South East of England. Its product range includes both IBM and Wang business systems, which it sells to a broad portfolio of customers in the South East of England and to a number of major corporations throughout Europe. It also provides a wide range of hardware and software products, several of which have been developed in house to an extensive dealer network. The group is based in the Pantiles, the elegant eighteenth century heart of Tunbridge Wells. The area provides reasonably priced housing, an excellent shopping centre and good schools. It is well positioned for access by train to London and, by means of the new M25, to the national motorway network. Micro Technology is now a multi-million pound company and will be expanding considerably over the next two years. As part of this expansion we require:

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If you are young, articulate, intelligent and hard working, with a proven record of success in the microcomputer or related industry, and you want to continue that success in the Garden of England, we need you to help us sell the IBM and WANG personal computers.

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As one of the leading suppliers of peripheral equipment for the IBM-PC, we need the services of a self-motivated sales professional, preferably with a good understanding of IBM products, to sell these market leading products to IBM authorised dealers and national accounts. If you feel you have something to offer for either of these requirements, please telephone Nigel Wood on (0892) 45433.



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Tunbridge Wells
Kent TN2 6TE

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He will also be responsible for:

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- an advanced computerised supervisory control and data acquisition system
- other computerised telemetry systems
- and DEC based micro/minicomputer systems

Interested to degree standard or equivalent you must have a minimum of 5 years experience in an operating environment involving real time systems and DEC (VAX/VAX) micro computers. You must have experience in software design. Knowledge with one or more of the following areas is desirable:

• Telemetry Systems • Communications Networks • Process Control

You must be able to demonstrate initiative in the application and development of operational systems and have the ability to understand and solve problems without supervision. You will initially be based in London, although the majority of time will involve working in Wiltshire. The move to Birmingham will take place in mid 1984. Salary is negotiable from £14,000 depending on age and experience, and could be more for an outstanding candidate. A London allowance will be paid whilst based there. Benefits include non-contributory pension and relocation assistance, where appropriate. This is an opportunity to make a key contribution to one of the most exciting developments of the decade.

For an application form, please contact Jeremy Webster, Personnel Officer, Technical, Mercury Communications Limited, 28/30 Theobalds Road, London WC1X 5NX. Tel: 01-404 5155 ext. 242.



(7804)

COMPUTER ENGINEER

for diagnostic software assessment.

The Telecommunications and Radar Branch REME at Millern in Worcestershire provides advice from which the Engineering Support of Army Telecommunications, Radar and Guided Weapon equipment can be formulated. The Software Division of the Branch provides specialist software expertise to enable REME to fulfil its role in these and other electronic, mechanical and aeronautical projects.

The successful candidate will lead a small team dealing, primarily during the development and introduction into service phase, with the diagnostic software required to support the many equipment projects which do not justify a dedicated software team in their own right. The team is responsible for assessing self test and ATE application software packages which will test and diagnose to component level and which include any interfaces and

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Candidates must have a degree or equivalent in electronic engineering or computer science or have a higher acceptable qualification. They must also have at least 2 years professional training or experience and should, preferably, have managerial experience. Evidence of specialist training in computing, software or microprocessors is highly desirable.

Starting salary in the range £1715 - £9680 according to qualifications and experience. Promotion prospects.

For further details and an application form (to be returned by 9 March 1984) write to Civil Service Commission, Alencon Link, Basingstoke, Hants, RG21 1JB, or telephone Basingstoke (0256) 68551 (answering service operates outside office hours). Please quote ref: T/6164.

Ministry of Defence

(7828)

Scientific Computing

The Daresbury Laboratory, situated in rural Cheshire, operates major national research facilities which are used by university scientists from most parts of the country and abroad. To support these facilities the Laboratory provides computing and other services for data processing and theoretical work. There is an extensive internal and external network and the computers in use include IBM compatible, DEC, GEC, Systems and others.

There are vacancies for people to work in:

- Operating Systems
- Network Support
- Scientific Database
- Data Reduction and Analysis

Applicants (male or female) should have a good honours degree (or equivalent qualification) in an appropriate scientific discipline. They should also have experience in scientific computing, operating systems or scientific databases, or should have a scientific background with an aptitude and desire to move into these areas.

The appointments will be made in the grade of Scientific Officer or Higher Scientific Officer according to qualifications and experience, on a salary scale £8,682 to £17,705 or £7,145 to £9,861 per annum. There is a non-contributory superannuation scheme, generous leave allowance and a flexible working hours scheme. Some assistance with expenses for house sale and purchase may be available.

CLOSING DATE: 9th March, 1984.

Further information may be obtained from K. B. Mansfield on Warrington (0925) 68000, Ext 467.

Application forms may be obtained from and should be returned quoting reference number DL/840 to:

The Personnel Officer
Daresbury Laboratory,
SERC, Daresbury,
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(7886)

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Please reply in the first instance to:

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(7822)

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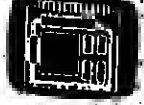
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C3 Systems

Inner London: Salaries to £18K

The Systems Group of a major supplier of Defence and Emergency services software has a number of urgent requirements from Analyst/Programmer to Consultant level. Candidates should have at least 4 years experience in Communications, possibly gained in a MOD establishment or Systems House environment, and also possess a degree, or equivalent, in a numerate subject. Ideally, applicants will have worked on systems such as Parnigan, Wavelet or BATES although serious consideration will be given to those with a background in System X or other telecommunication software. At the more senior levels it is essential that respondents have analysis and design skills with further experience of MMI, fault analysis, loading and sizing being highly desirable. All positions will attract a bonus payment or a company car.

Ref: 1/7/B

Electronics Design Engineers

Central London: Salaries to £14K

Profile: Our client, a leading British Systems House, is seeking recruits to meet continued growth in its business in Defence and the Emergency Services. The Company has a large number of projects involving the design and production of advanced digital electronic hardware.

Current projects include:

- * Interface equipment for local area network communication systems.
- * advanced signal processing hardware.
- * data acquisition and analysis systems.

Personnel: The Company is seeking several electronics design engineers with at least one year's experience of digital circuit design. Candidates should have the ability, and motivation to take on team leadership responsibility, and experience of, or an aptitude for, proposal preparation. The Company seeks some recruits who have moved on to successful project management after several years experience in digital circuit design. Applicants should have a degree or equivalent qualification. Experience of one of the following would be an advantage.

- * data acquisition and analysis hardware
- * special architecture computers
- * embedded microprocessor systems
- * advanced communications and networked systems

Rewards: In return for your personal commitment and technical skills the company offers an excellent salary together with an outstanding range of ancillary benefits. Applications: Please submit a well documented resume or alternatively telephone one of our consultants quoting Ref: 1/5/11.

Compiler Development

London & Home Counties: Salaries to £14K

A major Systems and Software House has recently embarked on a large new project Code Generation and Optimisation. Whilst requiring the expertise of a number of specific responsibilities will vary, depending on the ability and experience of the successful candidates will be involved from initial development of either a Pascal or Ada compiler preferably for 16-bit micros. Familiarity with all phases of compiler development is strongly desirable with particular emphasis placed on Code Generation and Optimisation. Whilst specific responsibilities will vary, depending on the ability and experience of the successful candidates will be involved from initial development of either a Pascal or Ada compiler preferably for 16-bit micros. Familiarity with all phases of compiler development is strongly desirable with particular emphasis placed on Code Generation and Optimisation. Whilst specific responsibilities will vary, depending on the ability and experience of the successful candidates will be involved from initial development of either a Pascal or Ada compiler preferably for 16-bit micros. Familiarity with all phases of compiler development is strongly desirable with particular emphasis placed on Code Generation and Optimisation.

Ref: 1/7/C

Real-Time Programmers

Central London: Salaries to £11K

A leading Systems House and Consultancy is seeking to recruit additional Real-Time Programmers for its Central London Head-Office. Suitable candidates should be graduates with at least 12 months' subsequent programming experience in a real-time scientific environment. It is essential that you offer fluency in at least one of the following: PASCAL, C, FORTRAN, ADA, CORAL-66 or Assembler. Hardware experience is less important, but preference will be given to applicants who have recently worked in a development role on POP-11/VAX; Intel 8080/86 or Motorola 6800/68000. Ref: 1/7/D

Simulation Systems

S. Home Counties: Salaries to £14K

Having recently gained a number of prestigious contracts, our client has an immediate requirement for FORTRAN Programmers and Simulation Engineers. The company is sited close to well developed motorway and rail facilities and therefore these positions will appeal to those living in the major Thames Valley towns, Heathrow and Gatwick areas or S.W. London. All candidates should be aged 23-32 years and preferably hold a numerate degree. Your recent programming or systems experience should have been in the areas of (a) VLSI and hybrid circuit design (b) simulation of ballistics/dynamic systems or (c) battlefield/ tactical weapons performance.

Ref: 1/7/E

(7891)

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MVS/VM SYSTEMS PROGRAMMING



- ★ Technical Support and Consultancy for major client installations.
- ★ Product Training in Chicago, USA.
- ★ European and USA user group meetings.
- ★ Technical excellence in the ultimate security of complex mainframe configurations.

SKK, with headquarters in Chicago, USA, are the authors of the renowned Systems Security Software - ACF2 (The Access Control Facility) which operates under the MVS, VM & VS1 operating systems. Founded over six years ago our growth continues with a user base of 200 in Europe, 80 + in the UK, with over 1,100 throughout the world.

We currently have requirements for Systems Programmers with practical experience in some of the following areas: System Generation of MVS, VS1 or VM, SMP, JES, TSO, ASSEMBLER, Storage Dumps, IMS, CICS. ACF2 experience is an added advantage. The ability to understand technical problems and be able to communicate their solution is of prime consideration.

You will be providing ACF2 support to an impressive list of major IBM installations. These positions are based in our Central London offices, where a dedicated team is engaged in responding to questions associated with the complexities of the IBM operating systems and other proprietary software program products as they relate to the ACF2 security products. You may also aid in technical support within the UK and European marketing environment and customer education.

These consultancy posts will afford the chosen individuals significant exposure to a wide range of software packages and tools in use within the IBM mainframe environment thus enabling continued technical advancement.

Positions also exist for individuals interested in working in France and/or Germany. Appropriate languages a prerequisite.

These are obviously unique and superb opportunities for further developing your technical, business and communication skills, whilst working with experts on the most respected product of its kind in the IBM market place.

SKK, a progressive leader in an innovative field, offers qualified candidates with a strong desire to further their careers, competitive salaries and comprehensive benefits including non-contributory life assurance and BUPA cover.

Send resume in strict confidence to:
SKK (UK) Ltd., 140 Brompton Road, London SW3 1HY.
Attn: Office Manager

(7801)

WORDPLEX

Systems Division
Software Specialists/
Programmers
£ negotiable, plus car.

Wordplex are a leading WP/Office Automation company with products ranging from Personal Computers to large distributed office systems.

We currently require Software Specialists and Programmers for active involvement in the development/enhancement of the following:

- | | |
|--|--|
| <input type="checkbox"/> Operating Systems | <input type="checkbox"/> Word Processing |
| <input type="checkbox"/> Communications | <input type="checkbox"/> Computers |
| <input type="checkbox"/> Electronic Mail | <input type="checkbox"/> Local Area Networks |
| <input type="checkbox"/> Electronic Filing | <input type="checkbox"/> Wide Area Networks |

If you have a sound assembler background, or experience of a block structured language (e.g. Pascal), and feel you could make a useful contribution in one or more of the above areas, we would like to talk to you.

Also urgently required:

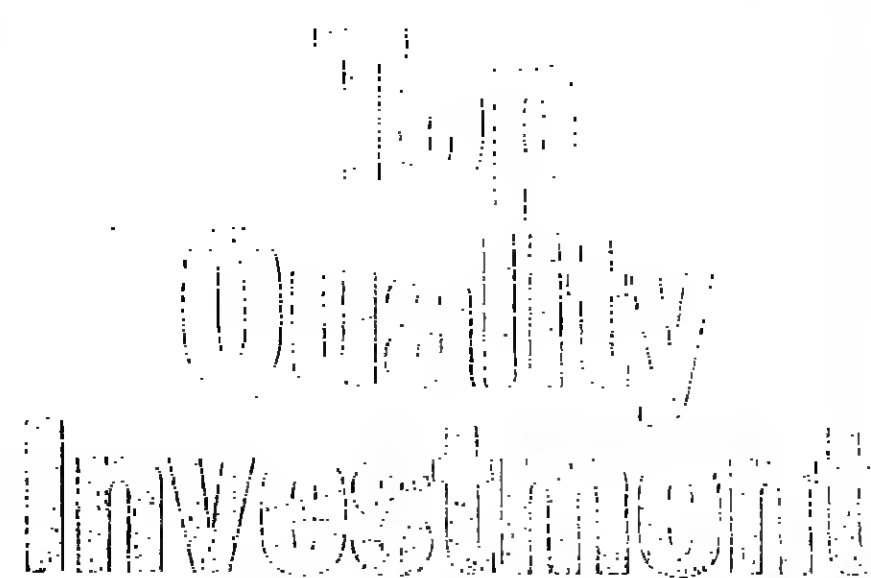
Analyst/Programmer, Business Systems £10K neg.
Located at Wordplex U.K. Management HQ in Reading. To be responsible for all aspects of System Design, Development and Maintenance on our in-house IBM System 34.

Applicants should ideally have two years RGP 2 experience and a thorough knowledge of masipics. Full training will be available on datapoint and wordplex equipment.

Please write with curriculum vitae or telephone George Shaw on 01-549 9236 (24 hour answering service) for an application form.

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Sloungate
Recruitment Advertising



For over 80 years Buckmaster and Moore have been one of the most progressive stockbroking firms in the City of London and are highly respected for the quality and range of their services. These include investment management, investment planning, individual portfolios, banking facilities, new company launches, economic analysis, company research, international and corporate consultancy as well as the usual broking services. However, unlike many City firms Buckmaster and Moore manage private money with the Private Clients Department alone managing over £400,000,000 of investments. Based within the London Stock Exchange Building, the working environment is dynamic, vital and richly rewarding. At the centre of this activity lies the Computer Department providing a wide range of facilities to cover the diverse needs of the company. Buckmaster and Moore are now embarking on a new phase of computerisation with the development of key processing and information systems and offer a real opportunity to join a growing and secure company in this important phase of their development. Every encouragement will be given to expand and develop potential and to progress your career. A degree will be an advantage to applicants as well as applications knowledge, systems experience and an ability to work as part of a team. Salaries are extremely competitive and are supplemented by a substantial bonus scheme, together with the normal benefits associated with a major company. For further information and an early interview please contact our recruitment consultant, Marshall Cligman, at the London office or evening (Epping 76085).

TCR Targa Computer Recruitment

19 Ropermaker Street London EC2V 6AS
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E2/1602

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30 Fleet Street, London EC4Y 1AA Telephone: 01-353 0981 24 hours
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(7880)

Sixteen years ago, Data General burst upon the computer world as a fully fledged major innovating company with the Nova minicomputer. It was way ahead of the competition and being one step ahead has been the Data General philosophy ever since. A steady stream of exciting new products followed which were reflected in a massive

increase in sales and a constant and dramatic record of planned growth.

1983 again saw Data General in the forefront of new computer developments. In the Spring, we launched the MV/10000, the world's most powerful 32-bit minicomputer. For performance/price, reliability and compatibility, it is unbeatable. We followed this in the

Autumn with our new generation of desktop microcomputers with minicomputer performance and stand-alone or on-line capability.

And in 1984, there's more to come in both hardware and software.

Don't you owe it to yourself as a professional DP person to find out more about Data General, the most innovative and fastest-growing computer company today!

Right now we're looking for several of the most talented people in the industry. And we mean talented. To qualify you'll need to have serious career commitment and real achievement behind you. We currently need Sales Executives, Software Support and Service Engineers but we are also keen to hear from computer professionals in other disciplines who have the ambition to share in the success of a genuine industry leader — Data General.

WHERE DATA GENERAL LEADS,

1968

• First company to offer a 16-bit minicomputer using medium-scale integration and incorporating multiple accumulators in the central processor.

1969

• First company to offer 15-inch circuit boards, now standard in the industry.

1972

• First 16-bit minicomputer CPU on a single printed circuit board.

1973

• First minicomputer company to establish its own semiconductor development and manufacturing facility.

1974

• First minicomputer company to offer error-correcting memories.

1975

• First minicomputer company to offer a stand-alone, asynchronous input-output processor as part of a standard product.

1976

• First minicomputer manufacturer to offer a 16-bit minicomputer in a chip.
• First ANSI 74 COBOL programming language for small computers

1977

• First interactive ANSI COBOL in the computer industry.
• First minicomputer company to develop "Witchester" technology disc.

1978

• First minicomputer processor to support array and vector operations.
• First company to introduce multi-terminal microcomputer COBOL.

1979

• First minicomputer manufacturer to offer minicomputer-based PL/I.

1980

• First public packet switching networking product, XODIAC software, for minicomputers based on the X 25 international standard.

1981

• First minicomputer company to offer IBM SNA compatibility

1983

• First company to offer the world's most powerful virtual memory 32-bit minicomputer
• First company to produce new generation microcomputers with minicomputer performance

1984

• First, and the years to follow will bring other industry firsts, but in the present Data General has the competitive edge to supply cost effective solutions to the Industrial Automation, Office Automation and Desktop marketplaces
• Unrivalled compatibility of software throughout the product range ensures protection of the customer's original valuable investment. From the low-end Desktop Generation to the top of the range ECLIPSE MV/10000, Data General has the advanced technology to provide its customers with industry leading cost-effective solutions.

OTHERS FOLLOW.

Please fill in the coupon for more information (attach your business card and/or attach your c.v. if you prefer). Send this coupon to: John Cunneill, Personnel Manager, Data General Limited, Hounslow House, 724-734 London Road, Hounslow, Middlesex.

I am interested in finding out how my career would benefit with Data General.

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The new MV/10000 is the most powerful computer in Data General's Eclipse family. It is the fastest and best price/performance virtual memory 32-bit computer on the market.

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Other (please specify) ☐ _____
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An ideal opportunity for SOFTWARE/HARDWARE ENGINEERS to move into TECHNICAL SALES SUPPORT

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Graphics systems have come a long way since drawings first came off the drawing board and into the computer. The latest colour graphics systems show a degree of sophistication and versatility that make them equally at home in an up front defence environment or in a fashion house.

Our client is part of a major international organisation, manufacturing and marketing a range of 'state of the art' plotting and graphics systems for use in all aspects of modern industry. They already hold a large share of the market and wish to further expand their already wide applications in an under-exploited market place.

This is where you come in. We are seeking two self motivated individuals to join a small sales support team involved in all pre-sales activities. Your role will be to advise customers on the various software applications packages and hardware configurations as well as carry out demonstrations, training and running benchmarks.

These are key positions and successful candidates are likely to have extensive experience with DEC or IBM systems and may have some knowledge of remote or graphics applications. Communications skills are also extremely important because of the high level of customer contact.

The company is based in Berkshire and full product training will be given in the UK and California. Conditions of service are excellent and reflect those of a large international company including medical, bonus and pension scheme.

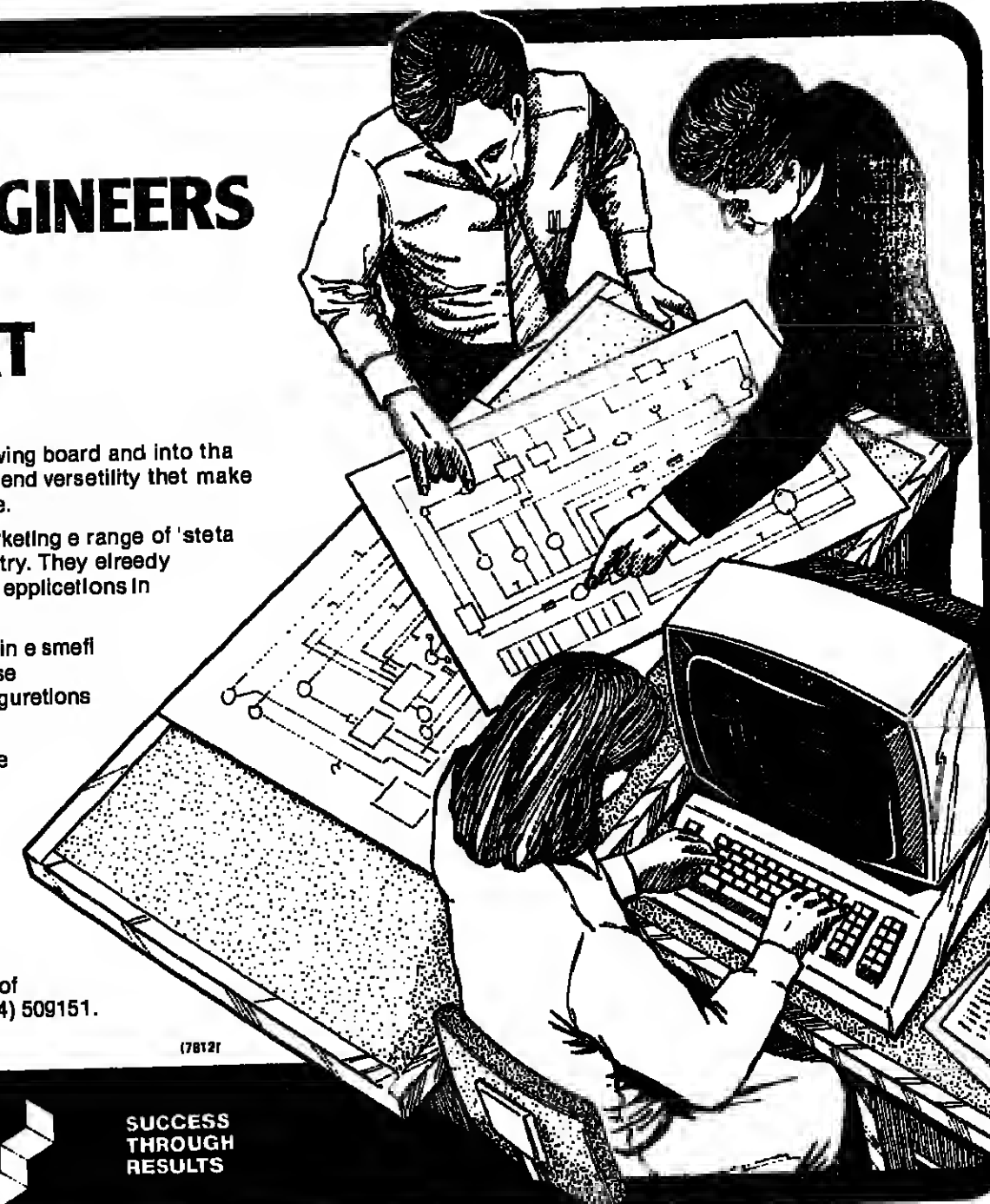
If you think you have the skills and initiative to join our client at the frontiers of graphics and plotting systems applications, contact Vel Abi on Reading (0734) 509151.

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INNOVATIVE BUSINESS SYSTEMS ANALYST

Technical Indexes is a rapidly expanding company within an international group and specialises in the distribution of a wide variety of microfilm and microfiche-based information systems that provide essential technical data to engineers, designers and buyers. We have a well-established DEC VAX 11/750 System as part of the production process. We are now ready to use the system for the development of new products. To assist us, we wish to recruit an energetic free-thinker who meets the following requirements: At least two years' experience in business systems analysis Some computer programming experience Professional attitude Probable age 25-30 We are particularly anxious to find someone who is not steeped in the traditions of conventional analysis, specification, design, coding, etc. We intend to pass straight from analysis to implementation using the ADMINS systems development tool. Knowledge of ADMINS is not essential but would be an advantage. If you are looking for better ways of fulfilling your role as a Business Systems Analyst, if you have the skills and initiative to join our client at the frontiers of business systems analysis, contact Vel Abi on Reading (0734) 509151. (7882)

OPPORTUNITIES IN USA

Circuit Test - MS/LSI Logic, ATE
Computer Programmers - POP 11, VAX/VMS
Systems Managers - VAX 11/750, VAX 11/780
Software Development - MC68000 system
Electrical Design - Power Distribution AC, DC
Digital/Analogue Design - EMI investigation
Shock/Vibration Analysis - IFEM/ANSYS

Please forward detailed resume to:
SAC Technology Group Ltd, Brunel House, Upper York Street, Bristol BS2 8DB. (7882)

We have recently completed a Systems Planning exercise in support of the Group's ambitious business plan. Our strategy requires the implementation of new real-time transaction processing and office automation services throughout the Group by the end of 1986, based on a policy of distributed mini and micro processors.

These new systems will be developed using PROMPT project management and YOURDON - based structured analysis and design methods, to which management is fully committed. We require someone, probably currently at Senior Analyst or Project Leader level with experience in using similar methods, to oversee the implementation of these standards and to direct the training of departmental staff. It is expected that success in this position will lead to a more senior project management role.

Stewart Wrightson
International Insurance Brokers

STANDARDS AND TRAINING
c. £15,000

This position, which includes attractive additional benefits, offers excellent career prospects within a young, progressive development environment. For further information contact Mike Kelly, Systems Development Manager, on 01-623 7511 or write to him, enclosing a current c.v., to Stewart Wrightson, 1 Camomile Street, London EC3A 7HJ.

COMPUTER PERSONNEL CONSULTANT

PUBLIC SECTOR APPOINTMENTS

Shift Leader

£10,870-£11,654 p.a. (Including Shift Allowance)
(2 Shifts, 7.30 a.m.-11 p.m.)
IBM 4341 (8MB) - VM - DOS/SE - POWER

We are looking for a person with a minimum of three years' experience as a shift leader on an IBM Mainframe. Initially we require someone with an in-depth knowledge of VM and DOS/SE/POWER, together with a good working knowledge of CICS and TP networking methods. Applicants should possess a mature and flexible personality plus the ability to manage and train operating staff in an extremely dynamic workplace. The Mainframe 4341 processes a large volume of batch work together with an increasing number of on-line systems. It also supports a growing number of distributed users, both local and remote. Each shift is also responsible for the running of a Wang VS180 with DP and Integrated Information System. If you feel that you have the qualities/qualifications to undertake this challenging job, then please contact David Clark on 01-883 5611 ext 2183, Ken Durnall ext 2208 or the shift leader ext 2532 for further information. Application forms, returnable within 14 days of the appearance of this advertisement, from the Controller of Financial Services, London Borough of Harrow, PO Box 24, Civic Centre, Harrow, Middlesex HA1 2JL. Telephone: 01-883 5611 ext 2335.

Harrow

Systems Analyst

An experienced analyst is required for this additional post in our expanding computer section. More resources are being made available to our departments and the successful applicant will be initially involved in testing and DLO areas.

The City Council operates an ICL ME36/54 with over 40 terminals in all departments and a major move into MICROVME computing is envisaged. The salary will be within the scale SO1/2 (£9,080-£10,638). Generous relocation expenses are payable in appropriate cases.

Application forms are available from the City Treasurer, The Guildhall, Cambridge CB2 3DQ. Telephone 0223 38977, ext. 301 and must be returned by 16th March 1984.

City of Cambridge

THE UNIVERSITY OF LEEDS
OFFICE OF THE REGISTRAR
COMPUTING ASSISTANT (PROGRAMMER)

An experienced COBOL Programmer is required to join a small team of analysts and programmers working in the Administrative Computer Unit. This Unit currently maintains an increasing range of batch and on-line systems on an ICL 2902/50 and an ICL 2902/50, and new on-line work is being actively developed.

For this post experience in an environment including microcomputers on large on-line mainframes would be equally valuable.

The starting salary is at an appropriate point on the UG Grade at the scale for Administrative staff (£20,100-£28,775) according to age, qualifications and experience.

Application forms and further particulars may be obtained from the Registrar, the University, Leeds LS2 9JT, quoting reference no. 115/83/24. Closing date for applications 16 March 1984.

University of Reading
Department of Land Management & Development
Applications are invited for a
RESEARCH FELLOWSHIP
in the Department of Land Management & Development.

The Fellow will research the application of Information Technology in the field of land management. Applicants should be qualified as surveyors or planners and have worked with computers in professional practice; or have an initial training and postgraduate experience in business applications of computers.

The appointment is for a fixed term of three years. Starting salary up to £9,425 p.a. LRS superannuation. The person appointed should take up duties on or after April 1, 1984.

Further particulars and application forms are available from the Personnel Office, University of Reading, Whiteknights, Reading RG6 2AH (Tel. 0494). Closing date March 14, 1984.

GREATER GLASGOW HEALTH BOARD
A. SENIOR SYSTEMS DESIGNER/PROJECT LEADER
£9,404-£11,434 PER ANNUM

Applications are invited for the above post in the board's computer centre which is located at 225 Bath Street, Glasgow. The centre is equipped with ICL 2958 computer and processes a wide range of applications for the Health Service. Both posts are for the Scottish standard of applications for the Health Service.

The successful candidate for post A will be responsible for the project team development of the system and will therefore require considerable experience in computing and proven ability to design and install complex systems. Programming experience is desirable while knowledge and experience of the National Health Service would be an advantage.

Candidates for post B should have had relevant experience and a good educational background. Additional allowances may be payable for relevant experience.

Application forms and job descriptions may be obtained from the Area Personnel Officer, Greater Glasgow Health Board, 225 Bath Street, Glasgow G2 4JT (Tel. No. 041-284 2785, ext. 2800). Information completed forms should be returned not later than Friday, March 2, 1984.

By telephone (0929) 21344 ext. 2088 and requesting our job information package.

CLYP

Micro Computer Training Programme

The CLYP is completing a £500,000 development programme which includes the first purpose-built micro computer training facility in the UK, plus other special educational facilities. The training programme will provide school leavers with job opportunities and high quality training in new technology. It is housed at Long Acre, Court Garden, WC2 and includes major shop front trading companies. The CLYP is also developing a link course programme for ILEA schools and an extensive evening programme, both including computer studies. We are seeking 3 staff as part of the training team.

Manager
£11,000-£13,500 to head the team, develop the training programme and other related initiatives. Experience in the technology and preferably educational experience required.

Business Applications Supervisor
£10,871 - to teach the business applications courses including general office practice, business software etc.

Software Supervisor
£10,871 - to teach micro operating systems, programming etc. Salaries are based on the Barnham scale and are currently subject to review.

For further details and conditions of service, please either telephone or write to the Director, Central London Youth Project Ltd., 29 Shornal Street, London WC2. 01-246 8377.

The closing date for applications is 2nd March 1984.

SYSTEMS PROGRAMMER

Salary up to £11,000 p.a.

Do you want:
* The challenge of working on the latest IBM hardware and software.
* The chance to develop your career in a progressive and growing organisation.
* The opportunity to live in an area of outstanding natural beauty, including the world famous Longleaze House.

The position is a nine-day working fortnight, free the assurance which is just a part of the outstanding employment package. If so, we will pay you as a systems programmer up to £11,000 p.a. to IBM System/370, which is shortly to be upgraded to an IBM 3081. Software is used as present includes VM/CMS, VSE, CICS, RACF, GENIE/VS1 supporting at present four on-line systems.

The computer division is unique in providing both District of Wokingham Council and Telford Development Corporation jointly. There is a firm commitment to both organisations to developing computer systems using the latest techniques available.

Application forms and job descriptions are available from the personnel unit (Tel. 01924 50251 ext. 451) and should be returned to the Personnel Manager, District of Wokingham Council, Wokingham House, Telford, Wokingham RG40 3LQ (Tel. 01924 50251).

Wokingham is an equal opportunity employer. Job sharing arrangements may be applicable in certain cases.

Wrekin

COMPUTER OFFICER

Applications are invited from graduates with a strong interest in natural language processing and a desire to work in an academic environment. As computer officer in the department of modern languages you would be involved with interfacing equipment, implementing packages and language processing, producing software for natural language processing, and giving appropriate instruction to staff and students in the department. The post is available for 12 months in the first instance, with some possibility of extension.

Salary - either related - £7,180 to £11,615 per annum.

Further particulars and application forms are available from Mr. A. G. Rice, Staffing Department, University of Aston in Birmingham, Red Cross, Birmingham B4 7ET. Telephone: 021-359 3811, ext. 4568, quoting reference number.

Prospective candidates are invited to contact Professor F. E. Knowlton on extension 4214.

Walsall

WANTED

Operations Controller, with 5 years computing experience, preferably on ICL2960/ME38. Sound supervisory, communication and co-ordination skills essential.

REWARD
Salary up to £9,000 p.a.
Excellent Pension
Generous Holiday
Generous Medicals
Outpatient

By telephoning Walsall (0929) 21344 ext. 2088 and requesting our job information package.

Walsall

WEST LAMBETH HEALTH AUTHORITY SHARPEY SCHAFER CENTRE

2 Analyst/Programmers (Scale 9/14) £9,409-£12,476 inc.

1 Systems Programmer (Scale 1/4) £6,712-£10,067 inc.

The centre specialises in health care management and clinical information systems. It currently provides a service via an extensive terminal network using a Honeywell Sigma 5 twin GEC 4190 and various micro-computers are being attached.

The two Analyst/Programmer posts are senior ones within the Department and the successful applicants will be expected to take responsibility for various systems. It is likely that one person appointed will be responsible for telecommunications within the District, including the Local Area Network, and previous experience in those areas would be an advantage.

For all three posts, an ADP allowance of up to £554 may be payable.

For application form and job description, contact the Personnel Department, St Thomas' Hospital, Lambeth Palace Road, London SE1 7EH. Telephone: 01-928 9292, ext. 2422.

For informal discussions, please telephone Dr A. V. Stokes, Director of Computing, 01-928 9292, ext. 2713.

Closing date for completed application forms - 29th February, 1984.

ASHFORD BOROUGH COUNCIL Ashford Shipway Junior Computer Unit

SENIOR SYSTEMS ANALYST Grade PO1 1-5. Salary £13,345 to £11,052 per annum

We require a Systems Analyst with at least two years' experience including implementation of database systems for two local authorities. The successful candidate will be responsible for the design and development of new systems and will be expected to supervise the work of junior staff.

Experience in any of the following areas would be advantageous: 1.1.149 and 1.1.150, structured programming, local financial systems, health care systems, education systems, etc. The successful candidate will be expected to supervise the work of junior staff.

Excellent conditions of service including an annual salary increase of 100% (subject to a maximum of £11,052 per annum) and a pension scheme. The successful candidate will be expected to supervise the work of junior staff.

Application forms and job descriptions are available from the Personnel Department, Ashford Borough Council, Ashford, Kent. Tel. 0223 82331/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/00.

Inner London Education Authority
SOUTHARK COLLEGE, THE CUT, SE1 8LE
LECTURER GRADE II

In Computer Aided Design required as soon as possible. In the use of the computer as a design tool mainly within the DAEI/Diploma courses including Graphics Facilities, 3D Design.

Applicants should be well qualified and should have industrial experience. Salary scales: Lecturer Grade II, up to £11,052 p.a. (plus 100% annual salary increase). The starting point depends on training, qualification and experience. Assistance may be given towards household removal expenses.

Further details and application forms obtainable from the Senior Administrator Office/PA at the College (01-928 9961) returnable by March 1st.

ILEA is an equal opportunities employer.

NORTH STAFFORDSHIRE POLYTECHNIC

SCHOOL OF MATHEMATICS COMPUTING AND STATISTICS LJUL SYSTEMS ANALYSIS AND DATA PROCESSING POST 318

A lecturer is sought to join the Systems Analysis Teaching Group led by Dr. Andrew Parkin and Dr. David Howes. The teaching responsibilities of the Group include systems analysis, database design, distributed and interactive systems, data processing management and introductory data processing for students studying computing, accounting, management and business.

The candidate must be able to teach at least one of these topics and have relevant practical experience in business or industry. For additional information, please contact Dr. Andrew Parkin on 0522 55111/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/00.

Further details and application forms available from The Personnel Office, Leicester Polytechnic, P.O. Box 11, Leicester LE1 7RH. Tel. 0533 461111/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/00.

Waltham Forest College

Principal Lecturer in Computing

The post of Principal Lecturer responsible for the leadership and development of the Computer Unit is available from 30 April 1984.

Salary - £13,184-£18,389 per annum inclusive. Application forms and further details available from the College Personnel Services Officer, Waltham Forest College, Forest Road, Waltham, London E17 4JH. Tel. No. 01-527 2311 Ext. 259. Closing date 21 days from appearance of advertisement.

Waltham Forest

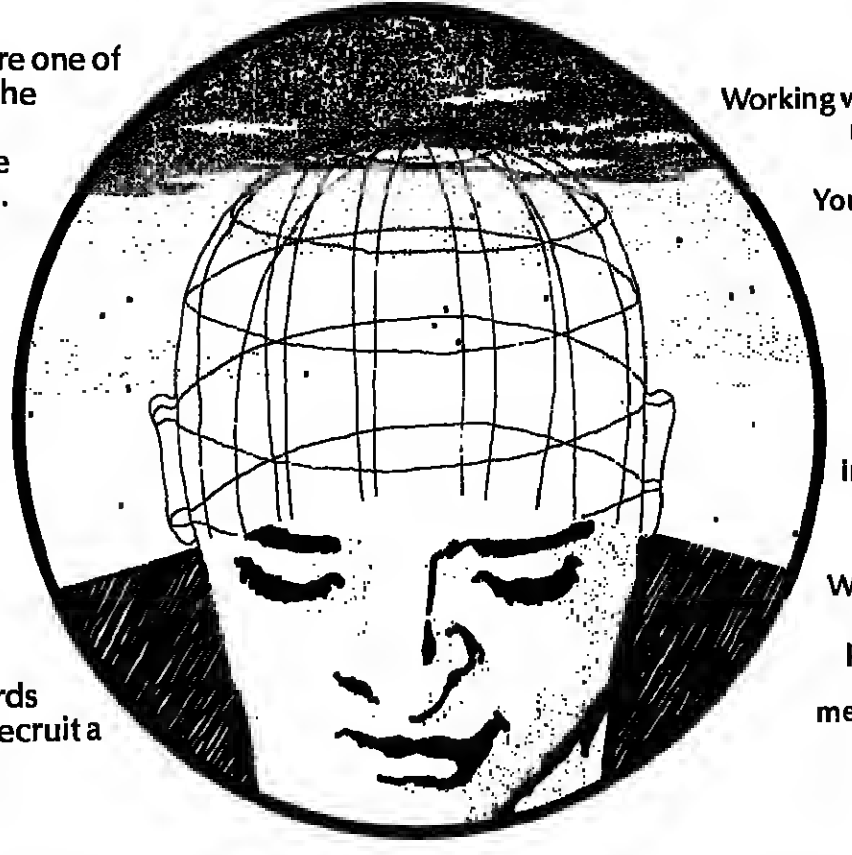
THE REALISATION OF EXCELLENCE

Management & Executive Selection are one of the foremost companies involved in the recruitment of highly skilled Staff Managers and Senior Manager for the high technology industries in Europe.

Our client base reads like the 'Who's Who' of the computer world, ranging from small fast growing 'state-of-the-art' software companies through to the large multi-nationals, system manufacturers, peripheral manufacturers and End Users alike.

Expansion of our central London facilities and the introduction of new technologies will enable us in 1984 to increase still further our marketing coverage.

In order to maintain our high standards of professionalism we now need to recruit a number of key professionals.



SENIOR CONSULTANT
Working with and extending our client base, you will be responsible for the day to day management of projects undertaken on behalf of our clients.

You will require the aptitude to plan in a strategic manner and implement recruitment projects, co-ordinating the resources of our extensive database, advertising and executive search facilities.

CONSULTANT
Working in a team environment you will be responsible for day to day client contact, interviewing and co-ordinating the assessment facilities.

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We are looking for personnel with experience in sales, sales support, engineering, analysis or programming who are looking for a new career direction. You will receive training in selection methods and gain practical experience within the recruitment industry.

The company operates on a quality circle style of management. Salaries for the above positions range from £8K - £17K plus participation in a quarterly bonus scheme plus fringe benefits.

For further information and Initial Interview contact Tony McGrath on 01-637 9611.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

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Now leading the industry in its approach to training and education, the Company will develop and improve upon the talents of a computer professional with a sound MVS background. Suitable applicants will be in either a Systems Engineer/Support role with a manufacturer/software house, or be a Systems Programmer with an end user, who is keen to learn more. In both cases an excellent salary commensurate with experience and potential will be paid with benefits including company car, discount share option, medical insurance, non-contributory pension, etc.

In the first instance, please contact our Advising Consultant, JIM SMITHAM, on 061-833 0427 (24 Hour Answering Service) or 061-439 2679 (between 7 pm and 9.30 pm Evenings and Weekends). Alternatively, submit a detailed C.V. to the following address: S.C.R. Ltd., International House, 84 Deansgate, Manchester M3 3EE.

Specialist Computer Recruitment Ltd

SOUTH: James House, 48 James Street, London W1M 5HS. 01-637 0671/448 081.
MIDLANDS & INTERNATIONAL: 36-37 Broad Chancery Street, Birmingham B3 3JY. 021-236 8761.
NORTH: International House, 84 Deansgate, Manchester M3 3EE. 061-833 0427.
BELGIUM: Avenue Louise 327, Boite 4, 1050 Bruxelles. 010 322-840 7161/71.
HOLLAND: Willemsoordweg 92, 1071 H.M. Amsterdam. 010 3120-760947.

Advance in an IBM environment

To maintain its dominant position in its own area of retail distribution, this Organisation is rapidly moving towards a leading position amongst high technology users. The present development programme provides exciting opportunities for ambitious computer professionals to work with the latest equipment in a dynamic environment where the computing function is recognised as integral to the future success of the Company.

Senior Analyst/Programmers Up to £10,500 p.a.

These positions provide opportunities for career minded individuals to play key roles in a fast moving environment. Applicants will have at least three years experience in the industry, a COBOL background combined with knowledge of IBM mainframes, probably MVS and ideally, both design and supervisory experience. The job satisfaction and career progression offered are exceptional, as new developments are continually introduced.

North West Opportunities

Work for a major public concern with an enviable profit record situated in the North West, and enjoy a secure and rewarding future.

Our Client is centrally situated, housed in modern purpose-built premises, enjoying easy access by excellent roadlinks and public transport facilities (free parking available).

For exceptional candidates, higher salaries than those indicated will be paid in addition to benefits which include generous staff discounts and assistance with relocation in appropriate cases.

To arrange a first interview, contact
JIM SMITHAM on 061-833 0427
(24 Hour Answering Service) or
061-439 2679 (Evenings and Weekends
between 7 pm and 9.30 pm)

Systems Analyst Up to £11,000 p.a.

This position provides an excellent opportunity for an Analyst/Programmer who wishes to develop their talents for analysis without losing their technical skills. The successful applicant will have a solid Analyst/Programmer background and must be able to demonstrate a proven record of systems design and implementation. He/she will welcome new problems and aim to solve them quickly. Equally important, the successful applicant must possess the personal attributes necessary to liaise with staff at all levels.

Programmers Up to £8,000 p.a.

This position provides an excellent opportunity for a Junior Programmer who wishes to take responsibility for the development of new systems in a fast moving IBM environment.

SYSTEMS DEVELOPMENT

c. £15,000 p.a. plus excellent benefits package.

The Challenge To take day to day responsibility for the ongoing systems development of a well known Lloyd's underwriting agency. Duties will include ensuring the smooth running of the computer and maintenance of existing systems, extensive end user contact, systems design work and liaison with the software house employed by the company. There is a continuing commitment to development as well as the usual day to day control activity.

The Company Our client is a leading Lloyd's underwriting agency managing several syndicates. They have an impressive track record and have consistently increased their turnover and profits throughout their history. This appointment is due to continuing expansion of their computing activities.

The Requirement Candidates will probably be in the age range 25-40 and should be able to demonstrate a background of successful systems implementation. The ability to communicate effectively with end users is essential as is the strength of character to control systems development projects. Experience of underwriting activities, and technical d.p. experience would be desirable, although the client would consider candidates with alternative backgrounds.

The Rewards The successful candidate will be given every encouragement to develop his career which will not necessarily be confined to purely d.p. activities. He or she will receive a basic salary in the region of £15,000 p.a. and benefits including LV's, Pension and Life Assurance, Medical Expenses Insurance, Permanent Health Insurance, Season ticket loans, and a discretionary annual bonus.

Location Our client is based in the heart of the City with excellent travel facilities close to hand.

Interested? Then please contact Chris Morrow of Total Selection Ltd who have been retained to advise on this appointment. He will be pleased to answer any further questions.

TOTAL SELECTION LIMITED

388 CITY ROAD LONDON EC1V 2QA

01-837 0451

(7887)

SENIOR BURROUGHS OPPORTUNITIES

Our client, Univasal (CMS) Ltd., is a small but well-established Software House with teams specialising in the clothing and textile industry and wine and spirits industry. Due to increased demand for their services they now require additional senior DP professionals to join them at both their Windsor and Leicester based offices.

SENIOR PROGRAMMERS to £13,000 + CAR

The minimum requirement is three years' solid CMS COBOL with the ability to make a positive contribution to the development of new systems and the expansion of existing products. Candidates must be self-motivated, professional in both appearance and attitude and be capable of liaising directly with Clients at all levels, often inexperienced computer users.

SYSTEMS ANALYSTS to £15,000 + CAR

Candidates should have a sound DP background with experience of designing commercial real time systems on mini or micro computers. They must also have seen at least one project through from feasibility study to full systems implementation. As there will be a good deal of customer contact and support, applicants must be professional in both appearance and attitude.

The Company has now reached a crucial stage with its planned expansion and is dedicated to recruit the right individuals to join their young and dynamic teams. If you can meet the above requirements and would enjoy working in a challenging and rewarding environment, contact Mike Harmer at Apex 01-404 4821 or Terry Forsey at Univasal (CMS) Ltd., Windsor (07535) 54587 for further details.

Apex is the

404 4821

Apex

Apex Computer Recruitment Ltd.
59 Grays Inn Road, London WC1X 8TL Tel: 01-404 4821.

Computer Services Manager

DEC/VAX environment Wembley

As one of the world's leading designers of advanced IC technology, the processing power necessary to support our sophisticated CAD requirement is truly critical.

You'll be taking the reins of a system that currently consists of 2 x VAX 11/780's each with 4Mb of internal storage backed by 2 x PDP 11/34 based graphic systems linked into DECNET and on PSS Network with 32 in-house terminals. If that doesn't quite sound enough, then you'll be pleased to hear that your first major task will be to acquire and commission 2 more VAX systems and an improved LAN set-up effectively doubling the installation's capacity.

Even with this enhanced capability, the rapid growth in user demand will require careful shepherding of system availability.

You'll be taking on commercial as well as technical responsibility for the development and maintenance of the systems resource and working closely with design heads. You'll drive the evolution of the system thereby putting to good use your interest in changes of technology. Your ability to get things done will be paramount.

One extra point is that in addition to the highly competitive salary this is a 9-5 role, which if you currently work on a shift rota basis could give you something to sleep on.

So call Chris McDonnell on (0522) 693389 during normal working hours or any evening between 7.00pm and 9.00pm on (0522) 752244. Alternatively send brief career details to him at: Marconi Electronic Devices Ltd., Duddington Road, Lincoln LN6 3LF.

Marconi
Electronic Devices

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HYBRIDS- INTEGRATED CIRCUITS-MICROWAVE-POWER DEVICES

COMPUTER DEVELOPMENT STAFF ARE REQUIRED BY TRAVICOM

TO SUPPORT AN EXPANDING DEVELOPMENT PROGRAMME

Travicom is a Thames Valley based company involved in the provision of computerised facilities for the travel industry using the most up-to-date micro computer and communications technology.

OUR ACHIEVEMENTS TO DATE INCLUDE

- Linking 36 airlines to nearly 1,000 travel agency offices with lease line and dial-up procedures, including the new Traveller Viewdata system.
- An automated airline ticket printer service.
- Interfacing airline systems with office-based computer systems.

AN EXPANDED PROGRAMME FOR 1984/85 INCLUDES

- Connection to a new range of supplier host systems including car-hire and hotels.
- Implementation of a private X25 network to cover the United Kingdom.
- Enhancements to existing services.
- Further developments in ticketing and Viewdata services.
- Product marketing overseas.

Computer professionals are required to join the present experienced and highly motivated team based in Maldenhead. The staff likely to be selected will have a minimum of two years' experience in one or more of the following areas - Micro Computers, 'Unix', Programming in 'C' or Zilog Assembler, Communications Software, Terminal Systems or Airline Reservations.

Vacancies exist up to Team Leader/Senior Analyst level. Salary range is between £11,000 and £16,000 according to experience. Company benefits include free private medical insurance, life assurance, pension scheme, special holiday discounts, luncheon vouchers and 22 days' annual leave.

Please apply enclosing detailed cv to:

Mrs J. L. Drake, Personnel Officer
TRAVICOM

13 Hermitage Parade, High Street, Ascot SL5 7HE
or telephone Ascot (0990) 20175 for further information

PERMANENT SYSTEMS & PROGRAMMING

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A highly challenging position awaits for the right individual within this small environment of specialist consultants. If you have extensive experience of CICS gained over at least four years call us now.
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SENIOR SYSTEMS PROGRAMMERS ALL AREAS

£14,000-£20,000
Extensive MVS systems experience is required by a number of organisations throughout the UK. Competent Systems Programmers with experience of SNA and/or other telecommunications systems desirable.
A10047

IBM PERSONNEL LONDON

£10,000-£16,000
Programmers to Programming Managers. COBOL CICS DL/1 expertise is required for a number of organisations. In addition to technical ability senior posts will require proven managerial experience.
H8081

PROGRAMMERS & ANALYST/PROGRAMMERS LONDON

£10,000-£12,000
Excellent ASSEMBLER programmers with on-line real-time systems experience is required by a number of installations. IBM background essential additionally a good knowledge of COBOL is desirable.
M10035

RPG II/III ANALYST/PROGRAMMERS MIDDLESEX

£14,000
Opportunity for Analyst/Programmers on System 38 in a growing young insurance company. Experience of Insurance or Retail applications is desirable but not essential.
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PROGRAMMER LONDON

£NEGOTIABLE
Strong UNIX combined with the 'C' programming language to carry out development and ongoing support within a highly professional software house environment.
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PROGRAMMERS	UNIX C	GERMAN SPEAKING PREFERRED	PROGRAMMERS
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SYSTEMS PROGRAMMER	VAX	VMS COBOL	PROGRAMMERS
ANALYST/PROGRAMMERS	POP	ATMS	PROGRAMMERS
ANALYST/PROGRAMMERS	TI 800	BASIC/COBOL	ANALYST/PROGRAMMERS
ANALYSTS	ICL	VME/B IOMS/TPMS	PROGRAMMERS
ANALYST/PROGRAMMERS	ICL	ME20 TPS COBOL	PROGRAMMERS
SYSTEMS PROGRAMMERS	ICL	ORS CICS COBOL	PROGRAMMERS
PROGRAMMERS	TANDEM	COBOL	ANALYST/PROGRAMMERS
ANALYSTS			

Our requirements are constantly changing - if your skills are not listed above you may still have the experience we require. Telephone us as we are always pleased to offer advice and to discuss how we can help you.

01-439 1856

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Datascene International Limited

Sceptre House 169-173 Regent Street London W1R 7FB
Telephone: 01-439 7871 Telex: 25851

(7814)

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CONTRACT OR PERMANENT - MAKE US YOUR FIRST CHOICE

Our success as a software house is reflected in the range and quality of positions we offer for contract or permanent staff. Our future in the international systems and software world is impressive and your career enhancement with us will be impressive too, to project management and beyond. Here are some of the positions on offer with some of our clients - major commercial organisations.

PL/1, IMS/DB prof. CICS and MVS CORAL 86 MANTIS COBOL, DL/1, CICS UNIVAC 1100 RPG 111, IBMS/38 VM or MVS COBOL, PRIME VM/CMS Texas Instruments PL/1, MVS, CICS GRAPHICS ACCOUNTING IV Telecoms or Message Switching exp. prof. CORAL, PASCAL, INTEL	Senior Programmer Programmer Programmer Programmer/Analyst Programmer System Programmers Programmer Programmer System Programmer Programmer All levels Software Engineers	London H. Counties Middlesex Sussex London Essex Herts Suffolk Essex London London South York London
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- * Excellent contract rates/salaries. * Full range of benefits.
- * Opportunity to work on challenging contracts throughout UK, Europe, Middle East and possibly USA.

Tangent

success in the Software world

Manufacturing Database

AMP Legg, a world leader in the manufacture of specialist processing equipment, is involved in a two year program to install a Manufacturing Database. This will run on a Honeywell DPS7 using the HMS Manufacturing Control System.

Analyst Programmer

£10,500 + relocation where appropriate, aged 28-35 whose primary role within our MIS Department will be to lead one of the implementation teams. A sound knowledge of COBOL gained in a manufacturing environment would be an advantage.

Programmers

(not less than £8,000) - aged 25-32 who can offer at least two of the following:

- * A minimum of 2 years' COBOL experience.
- * Experience of On-Line Transaction Programming.
- * Experience of Database Programming.
- * Knowledge of TDS and/or IDS II.
- * Experience on Honeywell Mainframe Equipment.

Senior Computer Operator - Shifts

(Salary negotiable) - with a minimum of 2-3 years' experience, preferably on Honeywell mainframes. You should be conversant with operational aspects of computer Operating Systems, System Utilities and JCL to the extent of taking corrective action and carrying out restarts in the event of abnormal termination of processing and be capable of assisting the Operations Supervisor in the optimisation of file-space etc. Afternoon and evening work-hours to be negotiated. To the successful applicants we offer five weeks' holiday, pension scheme with free Life Assurance and participation in our staff bonus scheme.

Interested candidates should write with full personal and career details to:
Chris Watford, Personnel Manager, AMP Legg (A Division of AMP International Limited), Newbury Road, Andover, Hampshire SP10 4DW, or telephone (0264) 62188 (ext. 278) for an application form.

AMP
Legg

SENIOR ANALYST PROGRAMMER

SYSTEMS 38

c.£15,000

CITY

ANGLO EUROPEAN CONTAINER LINE is a leading ship management and liner agency based in the City of London.

The company utilises System 38 hardware with links to four remote office locations throughout the UK, running Liner Agency Accounts, Container Tracking, Telex and Word Processing packages.

Future development plans include the computerisation of liner operations, ship accounting systems and the installation of direct links to ships.

To ensure successful completion of these projects, we have been retained to assist in the recruitment of a Senior Analyst Programmer able to define and implement the new systems with initiative, maturity, personal authority and stamina. Exposure to System 38 RPGIII is essential.

For further details of this genuinely challenging position offering a high degree of responsibility and involvement together with opportunities for occasional foreign travel please contact MELVYN DEARLOVE at Computer Two Thousand.

Computer Two Thousand Ltd.
Data Processing Consultants
217-218 Tottenham Court Road
London W1P 9AF

2000

(7874)

Tel: 01-636 7584 (24-hrs)

EDP VACANCIES IN KUWAIT

The public authority for Civil Information, a government department, is seeking to recruit qualified and experienced staff for its newly set-up Data Processing Department in Kuwait.

THE JOBS

1. **OPERATIONS MANAGER.** With at least 12 years' experience where at least four years were spent in setting up and managing a Data centre under the environment of IBM/30XX with knowledge of MVS operational requirements.
2. **SYSTEMS PROGRAMMERS (2).** Minimum three years in MVS support and related utilities.
3. **SYSTEMS PROGRAMMER.** Minimum three years' experience in TP support, mainly CICS and CMS and working knowledge on MVS operating systems.
4. **CAPACITY PLANNING MANAGER.** 12 years' experience in performance monitoring and HW/SW requirement analysis and planning. Good understanding and working knowledge of IBM/30XX hardware and software is essential.
5. **DOCUMENTATION SPECIALIST/TECHNICAL WRITER.** Minimum 10 years' experience in the following areas:

- Systems Analysis
- System Implementation
- Users Training
- Compilation of Documentation Manuals
- Quality control of systems development standards and procedures

THE CONDITIONS

In addition to tax-free salaries, which are negotiable, the successful candidate will be provided with free furnished accommodation, return air ticket for employee, wife and two children and 30 days' annual leave. The state of Kuwait provides free medical care to all residents in the country.

If you are interested, then write with full career details to:

Avery Associates
Recruitment and Executive Search
Douglas House
65A Duke Street
London W1M 6DH
Telephone: 01-499 8262

(7891)

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The last 3 months have been the most successful in the company's history and continuing growth has now created the need for additional salespeople to sell Computer Aided Engineering Systems to mechanical engineering and manufacturing organisations throughout

**MIDLANDS & NORTH
SOUTHERN ENGLAND**

Candidates are likely to be currently employed in selling CAD/CAM systems for a recognised major supplier or involved in the provision of engineering related computer services, preferably with an engineering qualification. Sales targets are relatively low for this sector of the market place and anticipated on target earnings will be

£32,000 + COMPANY CAR

Please contact Alasdair Scott (London), or Roger Dodd (Lichfield), quoting reference SSA/024.

This job is available to both man and woman.

LONDON & SOUTH29 Oxford Street
London W1, (01) 734 9776**MIDLANDS & NORTH**Cathedral House, Beacon Street,
Lichfield, Staffs. (0543) 2156612Answering Service after 6 pm and weekends
SALES TRAINING, MARKET RESEARCH, RECRUITMENT**VAX System
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Up to £16,000 + generous banking fringe benefits

Credit Suisse First Boston Limited, a major international investment bank based in the City, requires two experienced VAX System programmers. The bank has two 11/780 computers with a large in-house terminal population and a steadily increasing volume of fast response processing. One of the successful applicants will be responsible for the design and implementation of the VAX software environment, the other will assist.

Applicants must have at least one year's experience of VAX system programming design using Macro and some experience in a commercial computing group is desirable.

In the first instance, please contact:
Angela Cullen, Credit Suisse First Boston Limited
22 Bishopsgate, London EC2. Telephone 01-283 4200

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DPS 7 COMPUTER****MEDICAL INSURANCE AGENCY -
MAJOR INSURANCE BROKERS**

We are looking for an ambitious programmer to join our computer team who are developing a new database client accounting and information system. You should have up to two years' experience on Honeywell equipment ideally on L64 or DPS 7 hardware, using GCOS, COBOL, IDS2 and TDS. You will join a small team where everyone gets involved, so personality as well as the skills you can offer is important.

This could well be your first job move - in the RIGHT DIRECTION! INTERESTED? Ring or write to: Peter Barnes, Medical Insurance Agency Ltd., B.M.A. House, Tavistock Square, London WC1H 9JD. Day 01-388 1301. Evening (7-9 pm) 0727 57641.

(787)

**BOX
NUMBERS**

Box number replies should be addressed to:

Box Number
c/o Computer Weekly
Quadrant House
The Quadrant
Bath, Surrey BA2 2AS

Chr. Michelsen Institute is an independent multi-disciplinary research institute which serves industry and society in Norway and abroad. The work of the Institute is financed by means of government grants and by R and D Contracts.

CMI's dept of science and technology has a staff of 105, most of whom are graduate scientists or engineers.

COMPUTER GRAPHICS/ANIMATION

Applications are invited from highly qualified and suitably experienced persons for a position in computer graphics and animation. Applications with a Ph.D or M.Sc in computer science will be preferred.

Research activities in the dept of science and technology are concentrated in the following areas:

- Powder technology, dust and gas explosions
- Instrumentation and measurement technology
- Remote sensing and image processing
- Signal processing, including a seismic interpretation
- Mechanical design and precision engineering
- Electronic design

Many of our projects in these fields utilise computers for simulation, data reduction, and design purposes. In order to enhance our ability to interpret and understand computer output, we plan to expand our use of computer graphics and animation techniques. Further details of this challenging appointment can be obtained from Hækon Høiland at CMI. Deadline for applications is February 20, 1984.

CMI offers competitive salaries and an attractive work-place on the outskirts of Bergen, on the west coast of Norway. The institute will assist in obtaining suitable accommodation. Applications, accompanied by curriculum vitae, should be sent to the Director, Dept of Science and Technology, Chr. Michelsen Institute, Postboksveien 38, Fantoften, Bergen, Norway. Tel: + 47 5 284410. Telex: 40006 CMI N

(787)

UNIX OPERATORS

Immediate openings in U.S.A. for suitably qualified graduates with experience in UNIX V.3.25 Systems. Interviews in London. Attractive remuneration.
Reply with detailed CV to:
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**HOWARD
UK and European Assignments**

- | | | |
|---|-------------|------|
| (3) System Programmers, IBM, MVS, Assembler | W. Germany | 1yr |
| (2) Sen. Programmers, IBM, APL, Main, Micro | W. Germany | 6m+ |
| (2) Sen. Programmers, UNIVAC, DMS1100, TIF | Switzerland | 1yr |
| (2) Analysts, UNIVAC, DMS1100 | Switzerland | 1yr |
| (2) Designers, IBM, IMS, DB/DC | W. Germany | 6m+ |
| (1) Sen. Programmer, IBM, IMS, PL/I | Switzerland | 6m+ |
| (6) Sen. Programmers, IBM, IMS, PL/I | W. Germany | 6m+ |
| (1) Project Leader, IBM, IMS, Insurance | W. Germany | 1yr |
| (All assignments above require German speakers) | | |
| (6) Prog/Analysts, IBM, MVS, PL/I | UK | 3-6m |
| (3) Prog/Analysts, IBM, DB/DC, PASCAL | UK | 3-6m |
| (3) Prog/Analysts, IBM, IMS, PL/I, COBOL | UK | 6m |
| (3) Tech Programmers, VAX, FORTRAN, C, GRAPHICS | UK | 6m |
| (1) Programmer, UNIVAC, DMS1100, COBOL | Scotland | 3m+ |
| (1) Programmer, IBM, DB/DC, COBOL | UK | 3m+ |
| (1) Programmer, IBM, DB/DC, COBOL | UK | 6m |

For more information on UK and European contracts please telephone Clive Chetlin on 01-852 8092 or write to him at:
Howard Computer Services Ltd
Russell House, 140 High Street,
Edgware, Middlesex HA8 7BS

**Outstanding International Career Opportunity
TELECOMMUNICATIONS SYSTEMS SPECIALIST
(TELEPROCESSING)****BRUSSELS****Excellent Negotiable Package**

Our client is a major international banking corporation with its European Headquarters in Brussels from where they provide a world-wide service to ensure the efficient use of information technology systems.

An increase in the demand for more sophisticated electronic banking facilities both within the bank and externally has created the need for a specialist whose experience should include total familiarity with a wide range of IBM software/hardware in particular the following:

VTAM/NCPI/ACF/NCCP/NCDF/INTO

A knowledge of other mainframes and their associated software is advantageous. You will already have achieved success in network design and be conversant with capacity planning techniques and front-end processors.

To succeed in this challenging role, you should be a 'results-oriented' achiever, an outstanding technician and have a personality which will allow you to relate effectively to management and other specialists throughout the region and other locations worldwide. Future plans are exciting and will require you to spearhead several new projects. The position will involve a high degree of travel, principally in Europe. Career prospects are excellent. The superb range of benefits on offer will fully reflect the importance of this position.

Brussels is an attractive and cosmopolitan city with excellent housing, educational and social amenities.

To find out more about this outstanding opportunity call Ray Parker in confidence on 01-461 4653 (01-680 7865 evenings and weekends) or forward your cv.

**Shuter Smith International**28 Berkeley Square London W1. **01 491 4653**
Overseas Recruitment and Contract Consultancy

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(788)

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Please write with full details to Angela Callan, Credit Suisse First Boston Ltd., 22 Bishopsgate, London EC2.

CSFB

(7914)

SALES BIT

Quality of Management—83

How to survive in the jungle of high technology

FORGIVE me if I appear to be rambling on about product knowledge — but I don't apologise for it! It's a subject I feel strongly about and, as I suggested last week, the proportion of salespeople who are not in the world selling high technology products and armed with nothing more than superficial knowledge, is probably higher in the computer industry than in any other.

The reasons are fairly obvious: the introduction of new hardware and software is virtually a daily event within the industry at large. The rate of technological advancement seems to increase at an exponential rate as the unit price appears to decline in adverse proportion.

There is so much new information to be absorbed that it is difficult to keep up with it all. For example, in 1982 alone Data General introduced 27 new products into the UK. In their salespeople

In other words, they don't know what they are talking about. They know their products in three different models, 512K memory, main frame fixed or floppy discs, while for accounting, word processing and direct access to top secret files at GHQ, and that it does not be used when there's a lot of the month, but that's not what the salesman must know.

The salesman must know product inside-out, backed forwards and sideways. It's not the level of understanding where no one can ever ask a question to which he does not have an answer (not just an answer, but a knowledge of where to go to it: seldom a sales objective which he does not have to prepare rehearsal. After all, the objection is seldom anything more than a request for information. He must be constantly ready for detailed information.

Some may, through strength of character, be able to pull themselves up by their own bootstraps; but many will not

were obliged to get involved in a lot of learning in order to sell their products effectively. This demanded considerable commitment on the part of both the company and the salesforce; but they had the resources to do it.

For salespeople who have just entered the computer industry, there is the problem of not only learning about new products, but all the established ones too. This is difficult, but it is a problem that can be handled with dedication and application on the part of company and salesman alike.

For many, what is said to be training really means that the new recruit spends a couple of weeks in so with established sales and technical people, collects an armful of brochures and manuals, then he's on his own.

For established people and replenishment training, it's a question of do-it-yourself. It is difficult for salespeople to ensure long-term survival in this kind of technological jungle.

Sadly, sales and product training is not a fundamental part of the organisation of many of the smaller computer suppliers. When such companies approach recruitment consultants such as ours, they invariably ask for "ready-made" — people who have already received their training at the expense of some other company. They do so because they have no resources to provide comprehensive training themselves.

Nothing wrong with that, so long as specific product training is continually available. The problems start when the shortage of accomplished salespeople pressures them into employing those whose product or applications experience is not directly relevant, or who have not yet fully proved their ability to sell effectively within the computer industry.

Such salespeople are put into a situation which effectively perpetuates their lack of knowledge. Some may, through strength of character, be able to pull themselves up by their own bootstraps; but many will not.

For most people outside the computer industry (and for some within it), the whole business of computing is a bewildering landscape of incomprehensible technology and Orwellian possibility. So it is understandable that many who are new to computer sales hide their nakedness behind a veneer of superficial knowledge.

He will go to any lengths to get it. He must live the product.

But above all, he must realise that product training is a continuing process, that no one ever knows everything about anything.

This is an attitude of mind that cannot be left to the natural inclinations of the individual salesperson. An essential element of product training is promoting the importance and value of the continuing learning process, and responsibility for this firmly lies upon the sales manager.

At the end of the day, a salesman's job is to identify a customer's real problems, present the best solution his company can provide related to the funds that are available, and then persuade him to buy it.

Without comprehensive product knowledge, he cannot adequately enter the negotiation process without resorting to deception — as we all know where that leads to.

Alan Williams

PUZZLE ANSWER

9	9		
4	9		5
4	9	4	1
8	9		1
8	9	1	
3	9	1	5
3	9	4	2
7	9		2
7	5	4	2
9	5	2	2



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